The effect of vocational education and labor market institutions on personnel and organizational strategies – an international comparison

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Silvia Teuber
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Prof. Dr. Uschi Backes-Gellner

Prof. Dr. Paul Ryan

The Faculty of Economics, Business Administration and Information Technology of the University of Zurich hereby authorizes the printing of this Doctoral Thesis, without thereby giving any opinion of the views contained therein.

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Feeling gratitude and not expressing it is like
wrapping a present and not giving it.
(William Arthur Ward)

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CHAPTER 1

Introduction

A large variety of labor market institutions[1] (e.g., Freeman, 2008) and vocational education and training (VET) systems (e.g., Grugulis, 2008) exists in different countries, interacting with each other and influencing the behavior of companies by shaping the environment in which companies operate. The aim of this thesis is to fruitfully use the variety of both VET systems and labor market institutions to identify and analyze their individual and combined effects on companies' personnel and organizational strategies.[2] From the company perspective, we investigate how companies recruit, promote, and organize in different educational and institutional settings.

We gathered data on matched-pair engineering and retailing companies in five countries on three continents: Germany, Japan, Switzerland, the UK, and the U.S. Chapter 2 describes the research design and provides an overview of the VET systems and labor market institutions in the five countries included in this thesis.

To analyze personnel strategies, we investigate how companies fill vacancies at the level of skilled employees in production. In chapter 3, we analyze the extent to which matched-pair engineering companies in Germany and Switzerland, which produce similar products and therefore have similar skill requirements, use their apprenticeship graduates to fill vacancies for skilled production employees. Given the similarities of the dual apprenticeship systems in Germany and Switzerland, we find an empirical puzzle: Swiss companies use their apprenticeship graduates to a much smaller extent and instead show a

[1] The definitions of "institution" are manifold and dependent on the research field. Following the contemporary practice in political economy, we include organizations both defined as endurable entities with their rules and formally recognized members (North, 1990: 3; Hall & Soskice, 2001: 9) and their relationship with each other (e.g., in case of social partnership; Wolter & Ryan, 2011).

[2] Of course, the state also plays a role by influencing vocational education (e.g., via training laws), labor market institutions (e.g., by participating in wage negotiations, as it was the case e.g., in some Scandinavian countries), and company behavior (e.g., via taxes). However, the focus of this thesis is the *direct effect* of VET systems and labor market institutions on the behavior of companies in personnel and organizational issues, not on preliminary questions such as why certain kinds of VET systems or institutions exist or whether a company has chosen to produce in a country due to tax advantages. The analysis of these questions is beyond the scope of this thesis.

higher share of external recruitment. The observation that personnel strategies for filling vacancies for skilled employees with apprenticeship graduates differ so dramatically is surprising—especially in engineering occupations, which are also associated with net training costs in Switzerland—and has been neglected by previous research. Therefore, the first innovative contribution of this thesis is the identification and analysis of this empirical puzzle. The results show that labor market institutions are responsible for comparatively lower training costs in Switzerland than in Germany, thus reducing the necessity of retaining all apprentices to cover training costs. Since the occupational labor market is more volatile, Swiss companies do not wait until their apprentices graduate; instead they fill their vacancies as they arise which is possible as employee representation and collective bargaining agreements do not push for a high takeover rate of apprentices, as it is the case in Germany. A low level of employment protection in Switzerland suits the stronger external recruitment strategy.

After emphasizing the role of labor market institutions on personnel strategy at the level of skilled production employees, in chapter 4, we analyze whether labor market institutions and VET systems cause different patterns of internal promotion to the supervisory level. Despite the valuable insights of previous literature, little empirical evidence has examined within- and between-country differences in companies' promotion patterns. Therefore, the second innovative contribution of this thesis is its analysis of why companies' shares of internal promotions to the supervisory level are much more prominent in some economies than in others. To address the research question, we develop an analytical matrix by combining economic and institutional literature. The results show that the type of VET and the type of labor market institutions have separate effects on internal labor markets, as measured by the percentage of internal promotions to the supervisory level. While companies that provide company-specific and non-certified VET show a higher percentage of internal promotion than their counterparts with occupation-specific and certified VET, companies that act in more coordinated labor market institutions show a higher percentage of internal promotion than their counterparts that operate in more liberal labor market institutions. Therefore, those companies, in which both dimensions—VET and labor market institutions—reinforce each other's effect on internal labor markets, constitute "complementary" cases, as is the case Japan and Switzerland. In contrast, those companies, in which VET and labor market institutions weaken each other's effect on internal promotion constitute "mixed" cases, as is the case in German and U.S. These results contrast—at least regarding internal

promotion patterns—with previous literature that stresses the strong complementarities of VET and labor market institutions in Germany and the U.S. (e.g., Hall & Soskice, 2001).

Following the analysis of the effect of labor market institutions and VET systems on companies' personnel strategies in terms of recruitment and promotion, we finally focus on companies' organizational strategies in chapter 5. Given that the German combination of VET in the form of dual apprenticeship training and labor market institutions that support internal labor markets creates a competitive advantage for engineering companies, the question arises how matched-pair companies adapt to national institutional settings that are less favorable and less coherent, such as those in Switzerland, the UK, and the U.S. The third innovative contribution of this thesis is the analysis of this question with a set-theoretic analysis of VET and labor market institutions at the company level. We find that matched-pair engineering companies differ substantially in their span of control of production supervisors depending on the national-level institutional variables. In Germany, companies build a consistent cluster with a broad span of control; in the U.S., companies build a consistent cluster with a narrow span of control. In the less coherent countries, such as Switzerland and the UK, we find companies that have a broad and companies that have a narrow span of control. By measuring company-level institutions, which are functionally equivalent to the institutions at the national level, we are able to identify different institutional configurations also within countries and to link these company-level institutional configurations to the span of control.

In the final chapter, we synthesize the results and draw conclusions and implications for companies and policy makers.

CHAPTER 2

Research design and context information

Before analyzing the effects of vocational education and training (VET) systems and labor market institutions on the personnel strategies and organizational structures of companies, a brief description of the research design and the general context is appropriate. Therefore, the first section explains the motivation and necessity for the collection of the dataset that the author collected with colleagues from Germany (Prof. Dr. Karin Wagner), Japan (Prof. Dr. Shiho Futagami), Switzerland (Prof. Dr. Uschi Backes-Gellner), and the UK (Prof. Dr. Paul Ryan). The second section presents the research approach, shows the general context of the research project, and describes the choice of countries, regions, sectors, and companies. The third section outlines the countries' (vocational) education systems, shows the dominant forms and institutions of vocational skill provision, and provides some stylized facts on selected labor market institutions.

2.1 Dataset and research design

2.1.1 Problems of existing datasets

To analyze research questions concerning the effects of VET and labor market institutions on organizational and personnel strategies, such as recruitment and promotion decisions, detailed internationally comparable data at the company level on the type of VET and the shape of labor market institutions, such as employee representation or union coverage, are necessary. However, only few internationally comparable company data exist. Although the number of datasets within countries increases, the possibilities to use them for international comparisons of company issues are limited due to manifold problems (Backes-Gellner, Böck & Wienecke, 1994; Strauss, 1998).

First, the official definitions and measurements of the subjects of the examination differ significantly among countries. These significant differences apply to variables such as union density. Visser (2006) shows, for example, how different selections of the employment base can lead to significantly different rates of union density. Additionally, because the time

of the survey and its intermittency differ among the national datasets, the comparability of the data is decreased.

Second, most international comparative data on, for instance, industrial relations such as union coverage, works councils, and employer coordination are only available at the national level. Although the data provide valuable insights, the institutions measured are not evenly spread over all the sectors and companies within a country. Therefore, the high level of aggregation impedes a detailed analysis of the effect of, for example, works councils on company-level personnel strategies in an international comparison. Furthermore, nation-specific datasets suffer from the limitation of a low level of detail. Questions concerning whether the company is covered by a collective bargaining agreement capture a general picture; however, they disregard important details such as the hierarchical levels which are covered by wage negotiations or the degree of employment protection associated with the collective bargaining agreement.

Third, the meaning of seemingly functional equivalents, such as employee representation or collective bargaining agreements are context-specific and therefore have different functions and consequences in different countries. Employee representation varies significantly in its degree of influence depending on national regulations. Although trainees exist in all countries, their legal status, however, may vary significantly (Ryan, 2011), which has important consequences for their wages and for the company's managerial scope. Additionally, industry-wide collective bargaining agreements may exist in numerous countries; however, their influence on wage coordination may differ to a large extent depending on the inclusion of wages in the agreements, which may differ from sector to sector. Furthermore, functional equivalents at the company level need to be identified. Although labor market institutions at the national level, such as low employment protection, reduces the employees' incentives to invest in company-specific knowledge and to strive for an internal career, companies may succeed in establishing career paths that create functionally equivalent strong internal labor markets. Therefore, the country-, sector-, and company-specific contexts must be taken into account.

2.1.2 Field research and research method

Given the difficulties associated with existing data, we—a research team consisting of five researchers in Switzerland, the U.K., Germany, and Japan—specifically gathered data to

overcome the three previously described problems[3], namely, comparability by consistent definitions, company-level measurement of relevant variables, and the identification of functional equivalents.

First, by using consistent definitions and measurements, we ensured comparability, which is the main problem with official statistics. Second, we measured all the variables at the company level. We gathered information on employee representation, VET within the company, collective bargaining agreements, and the content and coverage of the agreements, among other variables. Therefore, we are not dependent on national indices but can directly identify any relationships between personnel and organizational strategies, and VET and labor market institutions. Third, as the meaning of some variables, such as "employee representation", "collective bargaining agreements", or "trainee", may be context-specific, we had, for the construction of the questionnaire for each country (except the U.S.), a "home researcher" on the team. To further ensure that we had the meaning and the functional equivalent correct, we did not send out questionnaires but, instead, went personally to the companies and interviewed them (for more information on that issue, see Withfield, Delbridge & Brown, 1998). In addition, we identified company-level functional equivalents, such as "internal labor markets", of national-level institutions, such as "employment protection." Our specifically collected data set allowed us to analyze our research questions.

In general, different research methods exist to conduct international comparative research (for an overview, see, e.g., Whitfield & Strauss, 1998[4]). As we aimed to collect qualitative and context-specific details (allowing an in-depth analysis) and to ensure, at the same time, a higher generalizability than a single case study (Strauss, 1998), we chose to conduct a comparatively large number of case studies. More precisely, we employed a matched-pair research design, as previously used in management, strategy, and comparative studies (e.g., Chaganti et al., 2008; Backes-Gellner, 1996[5]).

The selection of cases in this method is not random because companies are matched along certain criteria, such as size or industry. The main advantage of establishing these quasi-experimental conditions (Schnatterly, 2003) is to keep the matching characteristics, in

[3] The high share of field research via questionnaires or case studies in international comparative HRM studies reflects the lack of international comparable company-based datasets (see overview article of Clark, Gospel & Montgomery, 1999, Table 4).

[4] Arrayed on a continuum, case studies are the most detailed and fine-graded methods, while database research is coarse-grained and builds the other end of the continuum (O'Farrell & Hitchins, 1988).

[5] See also Steedman & Wagner, 1987; Maurice, Sellier & Silvestre, 1986; Hitchens & O'Farrell, 1988, 1987; Teece, 1981; Maurice, Sorge & Warner, 1980.

our case, Standard Industrial Classification (SIC) codes, constant and, thus, to rule them out as explanations for any variations found in the relevant outcome variables, in our case, personnel and organizational strategies (Strauss, 1998). Instead, the method allows focusing on the differences in the other variables as possible explanations, in our case, different VET systems and labor market institutions.

In contrast to the extensive literature describing the fact that VET systems and labor market institutions vary among countries (e.g., Bamber & Lansbury, 1993; Ferner & Hyman, 1992; Bosch & Charest, 2010), the aim of this thesis is to analyze the *effects* of these variations on company behavior. Therefore, the levels of analysis in the following chapters are not countries but companies where educational and labor market institutions have their most important impacts (Withfield, Delbridge & Brown, 1998). The matched-pair approach is perfectly suited for an analysis of company-level issues, such as personnel strategies or the organizational structure, and their interactions with macro-level institutional factors, such as country-specific labor market institutions[6] such as employment protection (O'Farrell & Hitchins, 1988). In addition, the collection of several case studies within the same country allows revealing the previously mentioned within-country differences.

The following section explains why certain sectors and countries have been chosen for the company-level analysis and presents the criteria with which matched-pairs have been identified.

2.1.3 Sector and country choice

The choice of countries and sectors was driven by the research goals, which were threefold. In addition to the personnel and organizational strategies discussed in the introduction, the setting and effects of apprentice pay, and the implications of corporate ownership and finance on training have been the primary focus of the analysis. To investigate these questions, variations in skill requirements, VET, and labor market institutions were necessary, leading to a specific choice of sectors and countries.

With engineering and retailing, we included not only two economically important sectors, but also different "production" processes and technologies and, therefore, skill requirements. While companies in the engineering sector rely heavily on firm-specific

[6] "The approach permits one to analyze micro influences—such as the internal division of labor within the plant—and their interaction with macro ones—such as conditions in local labor markets, national and regional training patterns, and so on" (O'Farrell & Hitchins, 1988: 68).

knowledge in their production areas, companies in the retailing sector depend, for their services, largely on general skills, such as basic communication and mathematical knowledge.

Furthermore, VET in general, and apprenticeship training in particular, differ in their history and importance as sources of skills in these two sectors. While the engineering sector has historically been the core of apprenticeship training and has mainly influenced its development and design, the recently growing service sector has been historically less involved in the shaping of apprenticeship training (Thelen, 2004; Gonon, 2009). Various authors argue that the service sector derives less competitive advantage from apprenticeship training than the engineering sector, a fact that is reflected in the comparatively lower apprenticeship ratios (Culpepper, 1999; Thelen, 2007; Werner, 2005). Due to the previously mentioned differing characteristics, these two sectors have been of interest in various comparative research projects (e.g., Maurice, Sellier & Silvestre, 1986; Carré, Tilly, von Klaveren & von Dahm, 2010[7]). In addition, we can expect that consistent results for both engineering and retailing are generally valid and independent of a particular case selection.

To create variation in VET and labor market institutions, we chose five countries, Germany, Japan, Switzerland, the UK, and the U.S., that differ significantly in these two dimensions (for further details on variations, see 2.2). The data for the European countries were gathered during the period from April 2008 to May 2009 (Ryan et al., 2011). The data from the U.S. and Japan were gathered from May 2009 to May 2010.

Due to the extended time for data collection, the problem arose that the international financial crisis, which hit companies all over the world and in all sectors[8], occurred during the interview period. Therefore, we cannot eliminate the possibility that our data (e.g., the intake figures of trainees) are biased in the light of the deteriorating economic context, especially as the companies in Japan and the U.S. were evaluated later. However, many of the questions on recruitment strategies aimed not only at current figures, but also at the usual practice of the company. These more general questions should at least smooth economic fluctuations and reduce the possible bias caused by the time of the interview.

Within the five countries, we focused on different regions, namely, Berlin, the Ruhr, Baden-Württemberg, and Hamburg, with an additional case in Bavaria in Germany, the Kantō region in Japan, German-speaking cantons in Switzerland, England in the UK, and the East

[7] See also Dore, 1973; Maurice, Sorge & Warner, 1980.

[8] Between the end of the second quarter of 2008 and the second quarter of 2009, the GDP fell in all five countries (-5.5% in Germany, -7.0% in Japan, -3.2% in Switzerland, -5.9% in the U.K, and -4.1% in the U.S.) while it increased again until the second quarter of 2010 (3.9% Germany, 3.3% in Japan, 2.8% Switzerland, 1.6% in the U.K, and 3.0% in the U.S., OECD, 2011).

Coast of the U.S. (geographically clustered in the "rust belt" between Massachusetts and Pennsylvania, and the area around Buffalo). By the regional diversification, we cover a broad range of companies within a country, thus ensuring that the results are not biased by region-specific conditions.

To reduce heterogeneity within the broad sectors of engineering and retailing and to apply the matched-pair approach, we used the Standard Industrial Classification (SIC) codes as primary matching criteria, organizing industries according to similarities in products, services, and production and delivery systems. We used the highest detail level available (4-digit SICs) to ensure the best product and production match possible. The final choice of sectors was determined mainly by the economic structures in the five countries. The database provided by Dun & Bradstreet gave an overview of the presence and size of companies in different engineering and retailing subsectors, and we therefore used that dataset for the company identification in all the countries but Germany, where we employed various German sources, including the directory "Wer Liefert Was." To further ensure a good match, we asked the companies for their main competitors within and outside the country. This approach proved to be very successful and allowed, for example, for the covering of all the main players on the U.S. East Coast. With this sampling policy, "leading" companies may be over-represented in our sample. However, because matching pairs is more important given our approach and our research questions, this over-representation does not cause major problems for the international comparison.

For engineering, we selected the pump and turbine subsectors; for retailing, we chose department stores, stores selling shoes, electronic devices, groceries, and furniture. The limited number of the engineering companies willing to participate in the study led to the inclusion of two additional subsectors, compressors and aero engines, whose skill requirements resemble the pump and turbine companies to a great extent. Compressors have a SIC code close to that of pumps, and the UK aircraft engine company also produces air gas turbines, which are quite similar to the other turbines in our sample[9]. Table 2-1 shows the distribution of participating establishments by SIC code.

[9] To also include companies in Germany that are not covered by a collective bargaining agreement, we interviewed companies from the electronic components subsector. As the production processes and the associated skill requirements of the electronic component companies differed, we excluded these companies from the analyses of the following chapters.

Table 2-1: Number of participating establishments by sector (SIC 1987)

Sector	Subsector	SIC 1987	UK	GER	CH	JPN	USA	All
Engineering	Pumps and pumping equipment	3561	4	4	4	2	4	18
	Turbines and turbine generator sets	3511	1	2	2	3	2	10
	Air and gas compressors	3563	0	0	1	1	0	2
	Aircraft engines and parts	3724	1	0	0	0	0	1
	All engineering subsectors		6	6	7	6	6	31
Retailing	Department stores	5311	4	2	3	1	3	13
	Grocery stores	5411	3	3	2	3	2	13
	Shoe stores	5661	1	2	2	1	1	7
	Furniture stores	5712	1	1	1	0	1	4
	Radio, TV and electronics stores	5731	1	2	2	0	2	7
	All retailing subsectors		10	10	10	5	9	44
Both			16	16	17	11	15	75

Source: UK, GER, and CH, Ryan et al., 2011, Table 1; JPN and the U.S. own fieldwork[10]

The subsectors have varying importance for the countries' economies regarding their share of employment (Table 2-2). While Dun and Bradstreet uses 1987 SIC classifications, we had to choose the 2003 SIC 4-digit codes closest to the interviewed establishments to obtain international figures on employment. Our engineering subsectors in Switzerland, the UK and the U.S. show similar employment shares of approximately 0.15% (Table 2-2, row 4). The share in Germany is twice as high, while the share in Japan is the highest with 1.16%. The general figures for the engineering sector (Table 2-2, row 1) reflect the shrunken importance of that sector in the UK and the U.S., compared to the other three countries. The employment share of retailing in general is, in all countries, greater than that of engineering (Table 2-2, row 5). Japan, the UK, and the U.S. have clearly higher employment shares in the retailing sector than the continental European countries. Our five retailing subsectors have the lowest employment share in Switzerland with 2.8%, followed by Germany and Japan. The U.S. and the UK both show a share of more than 5%.

[10] Table does not include 8 company interviews from the electronic components subsector.

Table 2-2: Employment by country and sector (SIC 2003)

Sector	SIC	Number ('000)					Share (%)				
		UK[a] 2007	GER 2007	CH 2005	JPN 2007	USA 2008	UK[a] 2007	GER 2007	CH 2005	JPN 2007	USA 2008
Manufacture of machinery and equipment	29	242.6	1,005.1	99.0	4,014.6	1,149.6	1.05	2.90	2.20	6.52	0.95
Engines and Turbines	29.11	14.5	34.3	0.8	n.a.	109.9	0.06	0.10	0.02	n.a.	0.09
Pumps and Compressors	29.12	20.3	70.9	4.4	713.1	62.2	0.09	0.20	0.10	1.16	0.05
All subsectors		34.8	105.2	5.2	713.1	172.1	0.15	0.30	0.12	1.16	0.14
Retail trade	52.1-52.6	2,372.6	2,519.1	347.4	7,651.4	15,614.7	10.28	7.26	7.73	12.44	12.91
Non-specialised stores (non-food)	52.12	197.2	165.7	22.5	550.5	2,977.4	0.85	0.48	0.50	0.90	2.00
Non-specialised stores (food)	52.11	850.0	702.7	64.9	996.0	2,570.7	3.68	2.02	1.44	1.62	2.13
Footwear and leather goods	52.43	49.4	78.1	8.8	43.7	208.2	0.21	0.22	0.19	0.07	0.17
Furniture and related	52.44	98.9	140.8	12.5	103.8	252.5	0.43	0.41	0.28	0.17	0.21
Electrical appliances, radio, TV	52.45	57.0	80.9	15.5	1,077.1	294.5	0.25	0.23	0.34	0.46	0.24
All subsectors		1,252.5	1,168.2	124.1	2,771.1	6,303.3	5.43	3.37	2.76	4.50	5.21
Whole economy	01-99	23,072.9	34,714.0	4,493.0	61,573.6	120,903.6	100	100	100	100	100

Source: UK, GER, and CH, Ryan et al., 2011, Table 3; JPN and the U.S. own fieldwork
Additional sources:
Japan: Statistic Bureau & Statistical Research and Training Institute Japan, Employment Status Survey 2007 (**平成19年** 労働力調査年報), http://www.stat.go.jp/data/roudou/report/2007/ft/index.htm, Japan Standard Industrial Classification (JSIC),
USA: US Census Bureau, Statistics of U.S. Businesses, http://www.census.gov/econ/susb/, North American Industry Classification System (NAICS)
a. England only

Additionally to the industry and product as matching criteria, we aimed for similar sizes of the companies (Table 2-3). For the engineering sector, all our data refer to a particular production plant. For the retailing sector, we contacted both single stores (department stores, large supermarkets) and (regional) headquarters. Therefore, we have a mixed size picture in retailing because we included partly single larger stores and partly aggregations of stores at the regional or national level. This explains the differences in the retailing size classes among the countries (Table 2-3). However, also in those companies where the unit is the entire company, we gathered information at the level of the stores themselves. In the following paragraphs, we use company as a synonym for plant and store.

Table 2-3: Distribution of company size (measured as number of employees) in engineering and retailing

Sector	engineering				retailing			
Size class	small	medium	large	sum	small	medium	large	sum
Number of employees	N<50	49<N<250	N>249		N<50	49<N<250	N>249	
UK	0	1	5	6	1	2	7	10
GER	0	0	6	6	1	2	7	10
CH	1	3	3	7	2	1	7	10
JPN	0	0	5[a]	5	0	0	5	5
USA	0	4	2	6	2	4	3	9

Data source: UK, GER, and CH, Ryan et al., 2011, Table 4; JPN and the U.S. own fieldwork[11]
Note:
[a] one company in Japan did not provide the information on size

As far as possible, we matched companies according to their size class (Table 2-3). Using the EU classification (European Commission, 2005), the sample includes 50 large companies with 250 or more employees (13 in the UK, 13 in Germany, 10 in Switzerland, 10 in Japan, and 5 in the U.S.), 17 medium-sized companies between 50 and 249 employees (3 in the UK, 2 in Germany, 4 in Switzerland, 0 in Japan, and 8 in the U.S.), and 7 small companies with less than 50 employees (1 in the UK, 1 in Germany, 3 in Switzerland, and 2 in the U.S.). The size differences between the countries were partly related to the kind of access to the companies. In Japan, for example, we were supported by an employers' association, which represents mainly large companies (see section 2.1.4)[12].

We are aware of the problem that, at least in some country combinations, the fit between the size classes is not perfect (e.g., solely large engineering companies in Japan compared to three large examples in Switzerland). However, these problems are not

[11] Table does not include 8 company interviews from the electronic components subsector.
[12] Furthermore, Swiss companies are generally smaller; approximately 97% of all the Swiss companies fall into the smallest category (BFS, 2009).

exceptional given this kind of approach, as other matched-pair studies have had difficulties in identifying exact matches (e.g., Maurice, Sorge & Warner, 1980; Maurice, Sellier & Silvestre, 1986). To avoid matching errors, Peck (1985) argues that the matching criteria need to be measurable and sufficiently unambiguous, as it is the case in this study when we use SIC codes. However, the criteria also need a certain breadth to allow matching, as matched-pairs are not identical pairs. Therefore, we argue that our sample of matched-pairs meets the criteria.

In the following section, we describe the difficulty of accessing companies in the five countries, the kinds of access strategies we used, and the hierarchical levels of our interview partners.

2.1.4 Contacting of companies, response rate, and interview details

After identifying the companies as previously described via their SIC codes or after they were mentioned as main competitors by their counterparts in the same country or in one of the other countries, we contacted the companies via channels that proved most appropriate for the specific country.

Usually a combination of a contact letter and a follow-up telephone call was sufficient to convince companies in Germany, Switzerland, the U.K., and the U.S. to participate. In Japan, we made use of the Kanagawa-ken employers' association. Without such personal intermediation, access to Japanese companies is nearly impossible. In addition, gaining access to U.S. retail companies turned out to be extremely difficult, as the companies were extremely reluctant to give any information to outsiders. After several unsuccessful contact attempts both at the headquarters and at shop level via letters, telephone calls, and even newsletters of local and national retail associations, we went directly to the stores and asked the managers for an interview, which proved to be the most successful strategy.

The varying degrees of willingness by the companies to cooperate in the study are reflected in the participation rate[13]. Switzerland has the highest participation rate with 79% (19 out of 24), followed by Germany with 60% (18 out of 30), and England with 43% (19 out of 44). The U.S. participation rate was 42% (6 out of 14) in engineering and 32% (9 out of 28) in retailing. Though the personal intermediation of the Japanese employers' association was helpful, we had a participation rate of only 40% (12 out of 30).

[13] Participation rates include the 8 company interviews from the electronic components subsector.

While the U.S. retail managers granted us, at most, 30 minutes of their time, the other company visits lasted between 1 hour and 3 hours (Ryan et al., 2011) including in almost all of our engineering cases a site visit after the interview. While the interview language was generally in the mother tongue of the interviewee, we occasionally used English when the interviewee felt capable of answering in that language. Most of the interviews were conducted by two or three research team members. A member of the company's own country ("home researcher") was always present, with the exception of the U.S. cases.

The interview partners were one or more managers, usually personnel managers (sometimes specialized on training issues) and plant or store managers. In addition to the data gathered during the interview and by a two-page pre-questionnaire on key statistical data, we collected information from the company's website and/or the (financial) press. In case the interviewees could not answer all questions during the interview or did not complete the pre-questionnaire, subsequent follow-up inquiries were conducted by telephone and by mail. During one of our U.S. company visits, we also had the opportunity to talk to various production workers and union officials. However, due to the already low participation rate, we did not systematically extend our research to employee representatives. We further explicitly guaranteed to treat all information confidentially.

In addition to the company visits, we interviewed the major players associated with apprenticeship training and labor market institutions relevant for this study. In the European countries with apprenticeship training we talked to the employers' associations and trade unions responsible for the engineering and retailing sectors. In addition, we interviewed a cantonal office and different engineering training centers[14] in Switzerland and, as a comparison, a German private engineering training center. In the U.S., we additionally talked to two experts in the field of educational systems and apprenticeship research. Overall, we conducted background interviews in addition to 75 company interviews[15] to gain an impression of the wider context.

The following section describes the basic structure of the questionnaire relevant for the analyses in the thesis.

[14] Additionally, we gathered information on the career paths of the employees from some participating companies (for further details see Ryan et al., 2011).
[15] Figure does not include 8 companies from the electronic components subsector.

2.1.5 Questionnaire design

For the company interviews, we used a semi-structured questionnaire to shape the interview. To ensure matching quality, we asked for the type of products and services, the batch size, and the type and strength of the competition (questionnaire-sections I and VI). The majority of the questions focused on the various research issues described in section 2.1.2. As the following chapters analyze the personnel and organizational strategies, we discuss the questionnaire in the light of these research questions (the complete questionnaires in English for the UK and the U.S. and in German for Germany and Switzerland can be found in the appendix; all questions have been adapted to the institutional setting and VET system of each country).

To investigate the effect of different VET systems and labor market institutions on the companies' personnel strategies, our questions focused on the intermediate skill levels associated with (initial) VET[16]. The questions aimed, therefore, at two occupational levels, skilled front-line staff and first-line management. The first category comprised skilled manual production and maintenance workers in engineering, and sales staff in retailing. The second category focused on production-related supervisors in engineering companies and department managers (in large stores) or store managers (in small stores) in retail companies.

After identifying the relevant positions within the company, we posed questions with respect to the three important areas of our research interest: (initial) VET, labor market institutions, and personnel and organizational strategies. We aimed to identify functional equivalents, that is, to find arrangements that fulfill the same functions even though their shape may be different (e.g., Cole, 1973; Sorge, 1976; Backes-Gellner, 1996). Although the training and entry qualifications differed depending on the (national) VET system (see section 2.2), we defined all the employees as having intermediate skills as long as they were functional equivalents within the production or service process, meaning that the sum of all jobs resulted in the same products. Therefore, we were interested in the organizational structure of the functionally equivalent production and service areas within the companies (section I of the questionnaire).

To investigate VET not only at the national, but also at the company level, we posed several questions about the length and content of the (initial) VET programs (section III of the questionnaire). We were also interested in the kind of qualifications associated with VET

[16] The intermediate skill level is defined as being between lower positions that need no (vocational) training and higher positions that can be reached only with professional education (Ryan, 1991).

(certification) and in the pool of applicants for the initial VET programs. Related to the qualification question, we investigated the takeover and turnover of trainees. In addition, we asked how companies cover vacancies at the functionally equivalent level of skilled front-line staff and to what extent initial VET feeds through the hierarchy (see section II of the questionnaire on recruitment behavior).

To measure labor market institutions at the company level, we included questions concerning the coverage by a collective bargaining agreement, the influence of unions, and employee representation (section IV of the questionnaire). As a functional equivalent to national-level institutions that improve the strength of internal labor markets, we included questions on the promotion behavior of companies to measure the real shape of internal labor markets (see section II of the questionnaire).

Using our questionnaire, we gathered company-level qualitative and quantitative information on all relevant issues, thus, the dataset allows a comparative analysis of company-level personnel and organizational strategies in different settings of VET and labor market institutions. Before going deeper into the analysis, the following section provides some stylized facts on VET systems and labor market institutions.

2.2 Overview of VET systems and labor market institutions in the five countries

The five countries included in this thesis differ in terms of their VET systems, including those related to our two sectors, engineering and retailing. This section outlines the principal differences in terms of educational attainment in VET relative to general training, and the content and regulation of the VET systems. In addition, we provide a short overview of the labor market institutions that are relevant for VET and our research questions on personnel strategies and on organizational structures.

2.2.1 Relative importance of VET

Comparative OECD figures (Table 2-4) show that all countries except the U.S. have upper secondary graduation rates of 90 percent or more. Though the graduation rates are similar, the relative importance of (pre-) vocational programs differs dramatically, reflecting the attractiveness and importance of VET in the entire education system. Switzerland has, by far, the highest share of young people completing VET programs, followed by Germany and Japan.

Table 2-4: Upper secondary graduation rates (2008)—sum of graduation rates for single year of age, by program destination, and program orientation

country	total (first time graduates)	general programs	pre-vocational/ vocational programs
Germany	97	42	56
Japan	95	72	23
Switzerland	90	31	71
UK	91	n.a.	n.a.
USA	77	n.a.	n.a.

Source: OECD 2010a, Education at a Glance, Table A2.1[17]

Unfortunately, the OECD does not provide figures for all the countries involved in our analyses. Therefore, we include, as additional information, figures on upper secondary enrollment patterns to reflect the relative importance of VET within a country (Table 2-5).

Table 2-5: Upper secondary enrollment patterns (2008) - Enrollment in upper secondary programs in public and private institutions by program orientation

country	general	pre-vocational	vocational
Germany	42.5	-	57.5
Japan	76.0	0.9	23.1
Switzerland	35.2	-	64.8
UK	68.6	-	31.4
USA	100	-	-

Source: OECD 2010a, Education at a Glance, Table C1.4

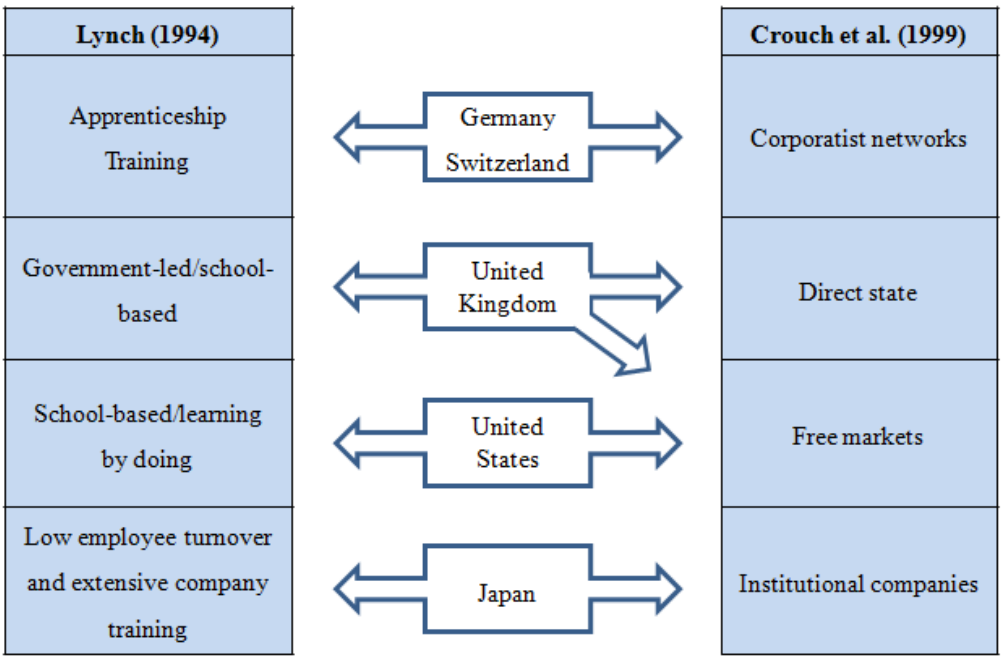
The enrollment figures show that VET programs are of some importance in the UK. In contrast, all young people in the U.S. go through general programs while apprenticeship or VET programs are seemingly non-existent. The following description of the U.S. education system indicates that apprenticeship training exists in the U.S.; however, it is a separate, non-

[17] In this context, figures of Eurostat on persons between 18 and 25 years without upper secondary graduation and not participating in education or training are of interest. Germany and Switzerland have better figures (Germany, 11.8%; Switzerland, 7.7%) compared to the UK which lies with a value of 17.0% above the EU-27-average in 2008 (BMBF, 2010, Fig. B2-4).

integrated educational path without (or only weak) institutionalized links to the general education system.

To provide a structured overview of the vocational education and training systems of the five countries included in this study, we make use of typologies. Various typologies of the education and training system in different scientific fields, such as education, sociology, economics, and political science exist (see e.g., Ashton, Sung & Turbin, 2000). While some educational categorizations focus on the providers of VET (e.g., Green's (1991) typology of an employer-led or education-led/college-based model), other approaches emphasize the role of the state (Edwards & Garonna, 1991) and the importance of cultural and historical origins (Moura Castro & Alfthan, 1992; Thelen, 2004). We use the following two typologies that are widely known in economic and institutional research and that focus specifically on VET while taking the role of the companies into account. Lynch (1994) categorizes the training strategies pursued by companies in each country according to the main institutional principle around which the training system is organized. Crouch, Finegold, and Sako (1999) use the dominant forms and the institutions of skill provision in (initial) VET as categories (Figure 2-1).

Figure 2-1: Categorization of countries included in the study according to Lynch (1994) and Crouch, Finegold, and Sako (1999)



Notes: This figure does not show Lynch's (1994) category "employer training tax" and Crouch, Finegold, and Sako's (1999) category "local firm networks" because we have not included countries in these categories, such as France or Italy.

Both typologies include cover five countries analyzed in this study and provide a systematic structure that is not too detailed (thus not every country becomes a category) but also not too broad (thus illustrating the existing variation). In the following sections, we use both typologies to describe the VET systems in the five countries.

Germany and Switzerland

Apprenticeship training

The significant importance of vocational education in general and of the apprenticeship system in particular justify Lynch's (1994) category "apprenticeship training" for Germany and—as the figures show—also for Switzerland (which is not included in Lynch's 1994 typology). VET is the dominant path of secondary education in both Germany and Switzerland. In Germany, usually more than 60% of school graduates start apprenticeship training (BMBF, 2011, Fig. 2: 23), while in Switzerland, even more than 70% of an age cohort enters apprenticeship training (SKBF/CSRE, 2010, Fig. 93: 143). One reason for the popularity of VET is that apprenticeship graduates have the possibility to move on to the tertiary level, either in the vocational track or in the academic track after passing different tests. In Germany, of the 13.5% who received a certificate to attend a university of applied science, 89% came from vocational schools, and of the 31.7% who received a certificate to attend a university, 14% came from vocational schools (own calculations based on BMBF, 2010, Table D7-1A). In Switzerland, the possibility of the Federal Vocational Baccalaureate ("Berufsmatura") exists, meaning that apprentices can obtain a certificate to attend a university or a university of applied sciences during or after their apprenticeship training. Approximately 12% of Swiss apprentices earn such a certificate (OPET, 2010: 15)[18]. The vocational track at the tertiary level is also popular. OECD (2010a, Table A3.1) shows tertiary-B (professional education and training) graduation figures of 10% in Germany and 19% in Switzerland[19].

[18] Also a change from the academic track to the vocational track is possible by starting an apprenticeship after the "Abitur/Matura". However, this direction is less common in Switzerland. In Germany, of the 1.2 million new entrants to the vocational track, approximately 13% have a certificate to attend a university or a university of applied science (own calculation based on BMBF, 2010, Table E1-2web, data on 2008).

[19] Tertiary-A graduation rates (academic track) are 26% in Germany and 32% in Switzerland.

Corporatist networks

Both apprenticeship systems are accurately characterized by Crouch, Finegold and Sako's (1999) keyword of corporatist networks, which ensure a uniform training content, common quality standards, and a certification that is accepted all over the country. In both countries, policies and laws lay the foundation for apprenticeship by regulating the meaning, content, and coverage of apprenticeship, and create the environment for the social partners who are, under the supporting role of the state and "Länder/Kantone", jointly responsible for developing and (re-)structuring apprenticeship occupations. The resulting VET ordinances record the occupational profile, type, and length of training[20] and the related qualifications. Therefore, the ordinances build the basis for the assessment and nationally recognized certification of apprentices. The quality of apprenticeship training is generally regarded as high (Wolter & Ryan, 2011; Franz & Soskice, 1995; Soskice, 1994; Bierhoff & Prais, 1997; OECD, 2009a; see also Chapter 3).

The United Kingdom

Government-led and school-based education

Compared to Swiss or German figures, VET is not the dominating form of secondary education in the UK. After compulsory education until the age of 16, approximately 65% of the 16- to 18-year-olds in England are receiving full-time education (which can be vocationally oriented, e.g., a narrow range of vocational courses in sixth form colleges), 7% are enrolled in Work Based Learning, and only 5% are enrolled in apprenticeship training (DfE, 2010, Table 4, data on 2008; OECD, 2009b). Persons over 18 years of age also enroll in Apprenticeship programs[21] and, in fact, 43% of the Apprentices are between 19 and 24 years of age (BIS, 2011, Table 4), though the share of the Apprentices out of all the students pursuing further education is only approximately 11% (own calculation based on BIS, 2011: 3).

[20] Apprenticeship training takes, depending on the occupation and the level of difficulty, 2 to 3.5 (4 in Switzerland) years.

[21] Apprenticeship training (with capital letter) is supported by the Department for Education and Skills.

Free markets and direct state

Many UK companies are not engaged in any kind of official VET program, such as Apprenticeship training and offer instead company-specific on-the-job training which is reflected by Crouch, Finegold and Sako's (1999) free market category. Still, the UK has an Apprenticeship system, which differs from the German and Swiss systems and, therefore, requires further explanation. In contrast to the stable apprenticeship systems in the continental European countries, the only continuity in British apprenticeship training seems to be change induced by state intervention (Rainbird, 2010; Crouch, Finegold & Sako, 1999, esp. ch. 4).

When the Conservative government came to power in 1979, neoliberal politics led to a weakening of sectoral bodies and the already weak social partnership. The number of apprentices declined dramatically between 1970 and 1990. Additionally, low-quality Youth Training Schemes (YTS) introduced in the 1980s contributed to the decline of apprenticeship training without providing an equivalent alternative (Marsden & Ryan, 1989). With the introduction of Modern Apprenticeships in 1994 in traditional (e.g., engineering, construction, engineering manufacture) and non-traditional apprenticeship sectors (e.g., health care), the government reinstated Apprenticeship training and attempted to evoke employer engagement. In contrast to the YTS, which were often detached from employers (Fuller & Unwin, 1999) each Apprenticeship program was designed by an occupational sector.

Though social partnership, which is the strength of the Swiss and German apprenticeship systems, has rhetorical support in UK policy documents, no institutional form comparable to that of Germany or Switzerland exists (Tailby & Winchester, 2000). Instead, centralization of VET policy occurred. The Learning and Skill Councils (LSCs), whose seats are allocated 40% to employers without guaranteeing the same proportion to unions, cooperate with several other organizations and establish, following a top-down approach, the national framework and the nationwide arrangements for funding agreements relevant to local LSCs who award contracts for training under the Apprenticeship program.

As no nationwide law sets the content and meaning of Apprenticeship training, the quality of the Apprenticeship training varies considerably by sector, including the two sectors in our analyses (Ryan, Gospel & Lewis, 2006). Sector Skill Councils (SSCs)[22] set training standards according to the needs expressed by the employers in the sector. While the engineering councils (SEMTA) have high standards, requiring long training schedules with

[22] The Sector Skills Councils, even though they are employer bodies, are not independent institutions; rather they rely heavily on government funding. The companies' confidence in these institutions varies significantly (OECD, 2009b; SSDA, 2006).

part-time, externally assessed vocational education for craft occupations (NVQ level 3[23]), most retail Apprenticeships are only at the NVQ level 2 and do not require any off-the-job VET, which is in stark contrast to the retail apprenticeship training in Germany and Switzerland. Furthermore, the assessment of skills and the inspection of training providers are subject to weak requirements (Lewis & Ryan, 2009). The Apprenticeship training ends in separate qualifications for competence in the workplace, assessed to nationally agreed occupational standards (NVQs), key skills (literacy and numeracy), and a technical certificate for the knowledge learned at a further education college.

Apprenticeship training (with capital letter) is supported by the Department for Education and Skills, and therefore competition to receive the public funding for training contracts and public administration plays a major role in the UK Apprenticeship system (Rainbird, 2010; OECD, 2009b; Lynch, 1994; Crouch, Finegold & Sako, 1999; Ryan, Gospel & Lewis, 2006). Various organizations, such as training companies, charities, further education colleges, and employers compete for training contracts.

The United States

School-based education

The U.S. system is strongly school-based, thus avoiding early choices between general and vocational education such as it is prevalent in the continental European apprenticeship countries previously mentioned (Bailey & Berg, 2010; Bosch & Charest, 2008; OECD, 2009c). The principal idea of the U.S. model is that students stay in school-based academic education until they begin specializing and learning specific skills required for their occupation. Thus, general education builds the foundation for a vocational specialization, which occurs in the final years before entering the workforce. Therefore, vocational specialization usually does not begin until the late high-school level[24].

[23] Apprenticeship training leads to either a National Vocational Qualifications (NVQ) at level 2 (Foundation Apprenticeship, FA, minimum 12 months) or at level 3 (Advanced Apprenticeship, AA, minimum 24 months). NVQ levels are competence-based qualifications and focus only on the execution of a task also without having participated in certain training before. The level 2 is regarded as basic craft or semi-skilled, and level 3 is regarded as a craft or technician level comparable to the German "Facharbeiter" (Crouch, Finegold & Sako, 1999; Backes-Gellner, 1996: 111).

[24] Secondary VET is provided via three types of public high schools: comprehensive high schools, area vocational schools (part-time vocational training), and full-time vocational high schools (U.S. Department of Education, 1995). However, only 0.3% of students were enrolled in vocational schools in the school year 2008/09 (own calculation based on the U.S. Department of Education, 2011, Table

The strong focus on general education in high schools is intended to give everyone the opportunity to continue on to a college or university ("college for all"). Similarly, colleges aim to provide the opportunity to continue and to earn a bachelor's degree ("bachelor for all", Bosch & Charest, 2008: 439). Therefore, VET becomes weaker both in high school and in college, even though colleges are some of the main providers of VET[25]. Approximately 45% of undergraduates are enrolled in community colleges, and of those, approximately 60% are enrolled in vocational programs (Bailey et al., 2004). The rest of the college students are enrolled in transfer programs that will allow them to transfer to four-year colleges (Bailey & Berg, 2010).

Learning-by-doing training strategies and free markets

Employers finally have to provide VET to the high school or college graduates. Vocational training at the company is usually not regulated at all and takes place mainly as on-the-job learning-by-doing. In the school-based system of the U.S., apprenticeship training once played a more important and prominent role than it does today (e.g., Strauss, 1965, 1968)[26]. Today, formal apprenticeships are registered with the U.S. Department of Labor when they meet the government standards of fairness, safety, and training.

Although apprenticeships are available in more than 1000 occupations, the overall number of active apprentices was almost 380.000 in 2010 (U.S. Department of Labor, 2011), which is a small number compared to the cohort of high school graduates of more than 3.3 million in 2010 (U.S. Department of Education, 2011, Table 110). Apprenticeships are most successful in unionized sectors, such as construction. Where the apprenticeship system exists, it has much in common with the European models. While the length of the apprenticeship varies between 1 and 6 years depending on the complexity of the occupation, the majority of the programs are 4 years in length. During the training, apprentices receive structured on- and off-the-job training, and training standards are usually developed by employee associations

100). In 2005, 15% of all credits earned (Carnegie units) by public high school graduates were in vocational subjects (own calculation based on U.S. Department of Education, 2011, Table 157).

[25] As a reaction to the crowding-out of vocational courses and the theorization of the vocational training, colleges are beginning to offer labor market integration courses, also called "reverse transfer", to provide some practical training (Bosch & Charest, 2008: 439).

[26] Initiatives of the government to introduce more formal employment and training systems, for example, during the 1990s, the introduction of a National Skill Standards Board or the School to Work Opportunities Act, failed due to the fear and resistance against too much governmental influence (Bailey & Berg, 2010). The resistance against too much governmental influence is not limited to the area of education and training, as shown by the fierce protests against the health care reform of the Obama administration.

and (groups of) employers (Crosby, 2002). Usually, per apprenticeship year, 2.000 hours of on-the-job training and 144 hours of related classroom instruction take place. The classroom instruction may also count toward certain college degrees. As in the UK system, apprentices are employees, usually older (in their late twenties) and have some postsecondary education or degree. After graduation, apprentices are awarded a certificate from the Department of Labor or an approved state agency, and they receive the status of a qualified craft worker.

Japan

Institutional companies, low employee turnover and extensive company training

Employer-based training plays the dominant role in Japan, even though various vocational training institutions at different levels exist. The Japanese situation is characterized by "institutional companies" (Crouch, Finegold & Sako, 1999: 29; Grugulis, 2008: 608). These large companies "produce" an institutional structure by establishing strong internal career paths, including lifelong employment guarantees and initiatives to provide training and re-training both on- and off-the-job. Lynch (1994) emphasizes these features of extensive company training and low turnover when categorizing the Japanese system. Hashimoto (1994) argues that the large amount of private-sector training is the result of Japanese companies wanting to create a homogeneous[27] workforce with respect to task-related skills, teamwork skills, company values, and corporate identities.

Students available for recruitment have usually already received VET at various school levels. After 9 years of compulsory schooling, students choose between academic (general courses at the high school) and vocational paths (specialized courses at the high school, specialized training colleges, colleges of technology or miscellaneous schools that are mainly intended to provide vocational or other specialized education). The percentage distribution of upper secondary school students by course type indicates that the proportion of those taking general courses has been increasing over time and accounted for 73% of the students in 2005. The proportion of those taking vocational courses was 24%[28] (MEXT, 2007, Table I-2-2).

[27] The Japanese education system already creates a largely homogeneous work force via a curriculum put together by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) that is valid for all of Japan from primary until upper secondary education (Hashimoto, 1994).

[28] The last percentages of about 4% are integrated courses that combine general and specialized courses and other specialized courses (MEXT, 2007, Table I-2-2).

Within the vocational courses, different major subjects, such as industry, commerce, or home economics, exist, and each student has to choose his subject in advance and then meet the specific entrance criteria. While half of the vocational education is devoted to practical exercise, internships are rare. In addition to the schools at the upper secondary level, so-called colleges of technology exist. Although their enrollment figures are very small (only 11.280 new enrollments in 2009 compared to 1.1 million high school entrants in 2009, MEXT, 2011, Tables 22-11, 22-5), these colleges are of interest because they offer high-level VET that are highly responsive to the needs of the Japanese industry, especially in engineering (OECD, 2009d). The equipment in the colleges of technology, compared to that of vocational high schools or universities, is very modern[29], and the internships provide connections to the labor market.

After high school, about 47%[30] of the upper secondary school graduates continued on to universities or junior colleges in 2005 (MEXT, 2007, Reference table to figure I-4-3), and 17% go directly to employment. In addition, about 26% of upper secondary graduates went to specialized training colleges and miscellaneous schools (MEXT, 2007, Reference table to figure I-4-3), that offer practical vocational and technical education. Specialized training colleges offer courses at the upper secondary (upper secondary specialized training schools) and post-secondary levels (professional training colleges). Professional training colleges focus on the high employability of their students, and due to their private status, they are comparatively free of regulation from the Ministry of Education, Culture, Sports, Science and Technology (OECD, 2009d). Students who have completed an upper secondary course of three years or more at specialized training colleges can apply for a university placement[31]. Furthermore, miscellaneous schools exist that provide vocational and practical training, for example, in dressmaking, cooking, bookkeeping, and automobile driving (MEXT, 2007). Though a large variety of (vocational) training institutions exists, in-company training is still the most important factor in the Japanese VET system (Grugulis, 2008).

[29] Therefore, the competition for this institution is very high. While the intake capacity is limited to 11.000 students per year, approximately twice as many students apply for the entrance exams (MEXT, 2011, Tables 22-11). Another attractive factor is that the institution's graduates may apply for university.

[30] This figure includes graduates who go to university (undergraduate, correspondence and short-term courses), to junior college (regular, correspondence and short-term courses) and to advanced courses of upper secondary schools (including those who entered higher-level schools while being employed), MEXT, 2007, Reference table to figure I-4-3).

[31] However, as employability seems to be more and more valued in the labor market, 25.000 junior college and university students transferred to professional training colleges in 2005 which is 12 times more than the reversed trend (OECD, 2009d).

In sum, the typologies show a large variation among the VET systems of the five countries. While dual apprenticeship training dominates in Germany and Switzerland, company-specific training characterizes the situation in Japan and the U.S. The UK is a mixed case in itself because some companies (especially in engineering) offer high-quality dual apprenticeship training comparable to that of Germany or Switzerland, while others (especially in retail) offer short company-specific on-the-job training similar to the U.S. Both for the functioning of the VET systems and with respect to the company's personnel and organizational strategies, various labor market institutions are of importance

2.2.2 Overview of labor market institutions

In the following paragraphs, we provide a brief overview of three of the most important labor market institutions for our research questions (further details are discussed in the respective chapters).

- Coverage by and the coordination of wages reflecting employer coordination and poaching danger (the higher the coverage by and the centralization of collective bargaining agreements, the higher the employer coordination and the lower the poaching danger).
- Employment protection reflecting employees' incentives to invest in firm-internal careers and employers' incentives to recruit externally (the higher the employment protection, the more attractive are internal labor markets).
- Existence and rights of employee representation influencing trust and cooperation between management and work force (the higher the influence and the more rights an employee representation has, the higher is its credibility and the higher is the probability that it can be a partner to the management thus creating trust in the workforce).

Collective bargaining

In line with previous literature (e.g., Schneider, Schulze-Bentrop & Paunescu, 2010), we focus on both the coverage by collective bargaining agreements and the coordination of wage setting. The majority of employees in Germany are covered by collective bargaining (63% in 2007, ICTWSS database, 2009), the coordination of wages is categorized at the second highest index value (4) meaning that mixed industry and economy-wide bargaining takes

place in Germany (ICTWSS database, 2009). In contrast, in the U.S., wage bargaining occurs predominantly at the company level (index value 1), and the coverage by collective agreements is very low with only 13% in 2007. Also in the UK, fragmented bargaining at the company level takes place; with approximately 35%, the coverage was higher than in the U.S. Japan and Switzerland take the middle positions. In both countries, coordination of wages takes place at the industry level, with some additional local and company bargaining (index value 3, ICTWSS database, 2009). Switzerland had with 48% a higher collective bargaining coverage of employees than Japan with 16% (ICTWSS database, 2009).

Employment protection

To measure the degree of employment protection, previous literature commonly uses the OECD index of the strictness of employment protection (OECD, 2008; Schneider, Schulze & Paunescu, 2010). The OECD index comprises three variables: protection of permanent workers against dismissal, regulation of temporary forms of employment, and specific requirements for collective dismissal. A high index represents strong barriers to, or high costs of, staff reduction through the termination of employment contracts. The overall protection index values show a clear gap between Germany (2.63) on the one side and the U.S., the UK, Japan, and Switzerland on the other (0.85, 1.09, 1.73, 1.77).

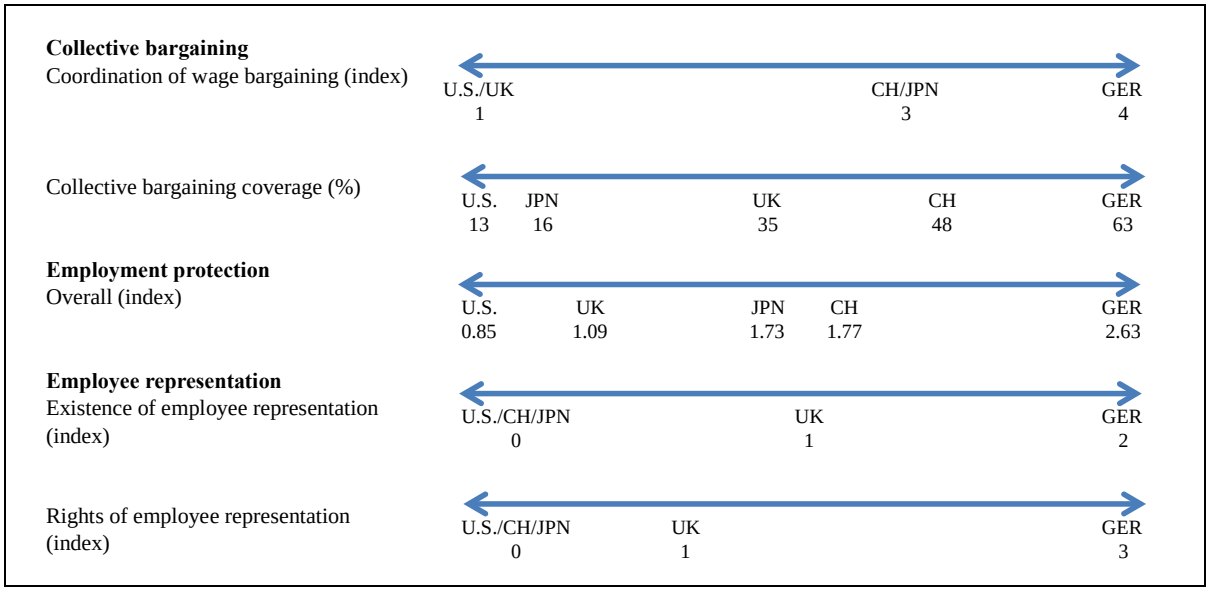
Employee representation

We use two comparative indexes of the ICTWSS database (2009) to reflect the existence and influence of employee representation in the five countries.

The first index measures whether employee representation at the enterprise, firm or establishment level (with 50 or more employees) is mandatory by law or by agreements between the central organizations of trade unions and employers' associations and also reflects the coverage of employee representation. In Germany and the UK, employee representation is, according to the ICTWSS database (2009), assured by law or agreement; the coverage, however, is higher in Germany (75% or more of eligible firms, index value 2) than in the UK (less than 75% of eligible firms, index value 1). According to the index in the ICTWSS database (2009), employee representation in the U.S., Japan, and Switzerland is absent or voluntary, existing only in some sectors and firms (a coverage of less than 25%, index value 0).

The second index of the ICTWSS database (2009) measures the influence and rights of employee representation. While German employee representation has the highest influence with its codetermination rights of company economic policies (index value 3), employee representation in the UK only has information rights (index value 1). The U.S., Japan, and Switzerland have the lowest index value (0) because employee representation is absent. The variation of the labor market institutions described above is summarized in Figure 2-2.

Figure 2-2: Overview of labor market institutions in the five countries



Coordination of wage bargaining: Index value 5, economy-wide bargaining, based on a) enforceable agreements between the central organizations of unions and employers affecting the entire economy or entire private sector, or on b) government imposition of a wage schedule, freeze, or ceiling. Index value 4, mixed industry and economy-wide bargaining: a) central organizations negotiate non-enforceable central agreements (guidelines) and/or b) key unions and employers' associations set pattern for the entire economy. Index value 3, industry bargaining with no or irregular pattern setting, limited involvement of central organizations and limited freedoms for company bargaining. Index value 2, mixed industry- and firm-level bargaining, with weak enforceability of industry agreements. Index value 1, none of the above, fragmented bargaining, mostly at company level.

Collective bargaining coverage: ranges between 0-100%, employees covered by wage bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargaining, expressed as percentage, adjusted for the possibility that some sectors or occupations are excluded from the right to bargain.

Employment protection overall: Compiled from 21 items covering three different aspects of employment protection: Individual dismissal of workers with regular contracts, additional costs for collective dismissals, and regulation of temporary contracts, scale from 0 (least stringent) to 6 (most restrictive).

Existence of employee representation: Works councils, or provision for the information, consultation and co-decision rights of employees in firms and establishments with 50 or more staff: Index value 2, employee representation at the level of enterprises, firms or establishments (above the threshold of 50 employees) is mandatory, based on public law, and or assured on the basis of a enforceable central or basic agreement between the central organizations of trade unions and employers' associations; and coverage of eligible employees is 75 or more. Index value 1, employee representation at the level of enterprises, firms or establishments (above the threshold of 50 employees) is mandatory, based on public law, and or assured on the basis of a enforceable central or basic agreement between the central organizations of trade unions and employers' associations; but coverage is lower than 75 percent of eligible firms. Index value 0, employee representation at the level of enterprises or firms is absent or voluntary, and covers only some sectors or firms (less than 25 percent of firms above 50 staff threshold).

Rights of employee representation in firms, enterprises, or establishments: Index value 3, works council or employee representation body has co-decision rights regarding company economic policies (mergers and acquisition, investments and divestments, appointments to the board, etc.; includes legal sanctions in case of breaching procedures for co-decision). Index value 2, works council or employee representation body has major consultation rights concerning social policies, including wage grading, training, job evaluation, procedures for recruitment and dismissal, etc. (includes legal sanctions in case of breaching procedures for consultation). Index value 1, works council or employee representation body has information rights concerning company policy in social and economic matters (with weak or absent sanctions). Index value 0, employee representation in firm, enterprise or establishment is absent.

Sources: OECD (2008), ICTWSS database (2009)

By outlining the research design of analyzing matched-pair companies in engineering and retailing in five countries, describing the VET systems and selected labor market institutions in the five countries, this chapter provides the broader context of the research project. In sum, the countries included in our study differ significantly both in their labor market institutions and their VET systems. This variation allows the analysis of the influence of the two factors on personnel and organizational strategies. In the following chapter, we analyze whether a variation in labor market institutions influences the share of external recruitment to the position of skilled production employee in matched-pair engineering companies. Previous literature has shown that labor market institutions can influence the training costs and strategies of companies (investment vs. substitution strategy). However, whether companies that train apprentices in different labor market institutions revert, to different degrees, to their own apprentices when they need to fill a vacancy is still an open question.

CHAPTER 3

Dual apprenticeship and personnel strategies–so similar and yet so different?
A comparative study of matched-pair engineering companies in Germany and Switzerland

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3.1 Introduction[32]

The dual apprenticeship training systems in Germany and Switzerland show clear similarities, both from a theoretical and a structural point of view (Soskice, 1994; BMBF, 2008; BBT, 2009; OECD, 2009a; OECD, 2010b; Franz & Soskice, 1995). Due to the huge substantial similarities between the two apprenticeship training systems, the resulting advantages are comparable: on the one hand, the high-skilled workers that emerge from the dual system (see e.g., Finegold & Soskice, 1988; Steedman & Wagner, 1987, 1989; Streeck, 1991), and on the other hand, the advantages associated with the takeover of these high-skilled employees such as the reduction of recruitment costs, the short induction periods, and the reduced danger of mismatches (see e.g., Wagner, 1999). Therefore, one would expect that training companies in Germany and Switzerland draw on their apprenticeship graduates to a similar degree to fill their vacancies for skilled production employees.

[32] We would like to thank the Anglo-German Foundation, the Hans-Böckler-Stiftung, SKOPE (Oxford), the Swiss National Science Foundation and the Federal Office for Professional Education and Technology (OPET), Berne, for their financial support; the managers and employees of the participating companies, employers' organizations, trade unions, professional organizations, and governmental authorities for the interviews on which our research work is based; the participants of two colloquiums at the Hans-Böckler-Stiftung for suggestions and comments; Michaela Kuhnhenne and Christian Dustmann for their consultation and support; Jim Foreman, Christian Busin, Jérôme Lutz, Katherine Meyer and Andrea Willi for their research support; Felix Wenzelmann and colleagues from BIBB, Samuel Mühlemann and Stefan Wolter from the University of Berne, Barbara Müller from SKBF, Jelle Visser from the University of Amsterdam, the Federal Statistical Office, Berlin and the Federal Statistical Office, Berne for providing additional data; the Social Science Research Center Berlin for research support; Johannes Mure, Marius Busemeyer, Geoff Mason and Hilary Steedman as well as two anonymous reviewers for their hints, suggestions, and comments.

However, the results of a comparative study of matched-pair German and Swiss engineering companies indicate differences: Compared to their German counterparts, Swiss engineering companies rely to a larger extent on external recruitment and use their own apprenticeship graduates to a lower degree as a source of skills to cover their need for skilled production employees. This finding is puzzling, especially when considering that Swiss companies do have the opportunity to draw on their own apprenticeship graduates.

To solve this empirical puzzle, this chapter analyzes the relevance and influence of labor market institutions on the design of apprenticeship training systems, the related training costs and benefits, and the behaviors of the employers and employees involved. First, taking the human capital theory (Becker, 1964; Stevens, 1996) into account, we investigate whether the types of skills acquired during apprenticeship training differ between the two countries and whether these differences explain the aforementioned counterintuitive findings. Second, we analyze how institutions such as company-level employee representation and trade unions directly or indirectly steer the personnel strategies of companies, e.g., by influencing the cost-benefit aspects of the apprenticeship training. Finally, we focus on the extent and manner in which the institutional aspect of employment protection affects employers' and employees' incentives for pursuing internal labor markets.

To place the results into a broader context, we embed our findings in the international comparative Varieties of Capitalism (VoC) approach (Hall & Soskice, 2001, henceforth, designated as the VoC approach). Although this political economy approach categorizes both Switzerland and Germany as coordinated market economies (Hall & Soskice, 2001), our sector-specific investigation shows that the two countries tend toward different directions—on the one hand, to the pattern of a liberal market economy such as that of the U.S. (for Switzerland), and on the other hand, toward the pattern of a segmentalist system such as that of Japan (for Germany; Thelen & Busemeyer, 2011).

The contribution of this chapter is to link the discussion concerning the costs and benefits of apprenticeship training, the training motives (whether investment or production motives), and the retention of apprenticeship graduates by training companies (Mühlemann et al., 2007; Schweri et al., 2003; Wolter & Schweri, 2002; Schönfeld et al., 2010; Beicht, Walden & Hergert, 2004; Dionisius et al., 2009; Mohrenweiser & Backes-Gellner, 2010) to the companies' personnel strategic question of how to fill skilled production employee vacancies.

The chapter proceeds as follows: the second section describes the conceptual and structural similarities of the dual apprenticeship training systems in Switzerland and Germany. The third section illustrates the design of the country-comparative study and presents its counterintuitive empirical findings. Section four constructs three hypotheses as possible explanations for this empirical puzzle, followed by an analysis of whether the interviewed companies behave consistently regarding these explanations. Section six illustrates where the results fit within the international context of the VoC approach and indicates the need for further research. The paper concludes with a short summary of the results.

3.2 Similarities between the dual apprenticeship training systems in Germany and Switzerland

Concerning the conceptual and practical design of the dual apprenticeship training system, Switzerland and Germany are almost identical (Soskice, 1994; Franz & Soskice, 1995; BMBF, 2008; BBT, 2009; OECD, 2009e; OECD, 2010b). Conceptually, the corporatist structures in the dual apprenticeship training systems are significant for both countries. Within the legal framework of the Federal Vocational and Professional Education and Training Act and guided by the federal state[33], social partners[34] jointly participate in the development and (re-)structuring of apprenticeship occupations. Therefore, the learning contents match the actual needs of companies and comply with the interests of the apprentices in learning high-quality and transferable skills. The resulting vocational education and training (VET) ordinances ("Berufsbildungsverordnungen") record the occupational profile and the related qualifications. Companies in both countries commit themselves to comply with the occupation-specific curriculum by signing a binding apprenticeship contract.

The practical design manifests its dual character in both countries by alternating school-based[35] and company-based training. In addition, industry courses are provided in Switzerland—and in Germany, where required—to impart a broad occupational base of knowledge. Training companies have to adhere to certain quality standards. Institutions in both countries take responsibility for observing the training companies (in Switzerland, the

[33] Federal Ministry of Education and Research in Germany, Federal Office of Professional Education and Technology in Switzerland.
[34] Also called "Organisationen der Arbeitswelt" in Switzerland.
[35] The school-based part of the apprenticeship training is publicly financed in both countries. Typically, 1-2 days per week are spent at school.

cantonal offices for intermediate and vocational schools, and in Germany, the chambers of industry and commerce associated with para-public and quasi-legal rights and responsibilities, Thelen, 2007). After the apprenticeship period, apprentices are subject to an external examination, established at the national level and with the social partners involved, reflecting again the sense of corporatism. The national standardization and certification of skills ensures their transferability and the occupational mobility of the apprenticeship graduates between the companies of particular sectors (Wolter & Ryan, 2011).

From an economic perspective, various studies highlight the quality of the skilled workers that arise from this type of dual training system (e.g., Steedman & Wagner, 1987, 1989; Maurice, Sellier & Silvestre, 1986; Bierhoff & Prais, 1997). These workers comprise an important element for the international competitiveness of German and Swiss companies because they are capable of both responding flexibly to customer-specific requests and fabricating high-quality products (e.g., Streeck, 1991).

From a company perspective, the provision of apprenticeship training places offers various advantages (Schönfeld et al., 2010; Mühlemann et al., 2007; Schweri et al., 2003; Sadowski, 1980; Wagner, 1999). Besides the possible direct costs savings by replacing unskilled or skilled workers with apprentices (Lindley, 1975), providing apprenticeship training can also have indirect positive effects, for example, by increasing the company's reputation as a high-quality workplace and therefore increasing the company's success in recruiting skilled employees (Sadowski, 1980; Backes-Gellner & Tuor, 2010). Furthermore, the training period allows a company to screen future employees and to choose those with the highest performance levels and that are the best match to the company (Franz & Zimmermann, 2002; Soskice, 1994; Jovanovic, 1979). Therefore, the takeover of one's own apprentices, in particular, offers the advantage that firms can save recruitment costs[36] and avoid the dangers of mismatches with externally acquired employees or a loss of productivity if no appropriate employee can be found (Stevens, 1994; Merrilees, 1983[37]). Furthermore, the company-specific knowledge acquired during apprenticeship leads to shorter induction periods and thus lower training costs compared to employees recruited from the external market. Finally, employee turnover decreases because apprentices develop loyalty to their company during the apprenticeship period (Schönfeld et al., 2010; Schweri et al., 2003).

[36] In the case of external recruitment, additional costs arise for advertising and selection.
[37] See also Backes-Gellner (1996) for an analysis of how the stock of skills depends on production strategies and competitive environments.

Taking into account the similarities between the dual apprenticeship training systems, the associated quality of the apprentices and the resulting skilled workers, and the multiple advantages that companies extract from taking over apprentices, we expect that training companies in Switzerland and Germany draw on their own apprenticeship graduates to the same degree to cover their needs for qualified employees[38].

3.3 Empirical findings

3.3.1 Data

To examine personnel strategies, we need data at the plant level because recruitment strategies and institutional settings have to be measured at the relevant unit. Since we require detailed company data, sample size is small by necessity. Therefore, we decided to use a matched-pair strategy to reduce heterogeneity. To do so, we collected plant-level data on companies gathered in Germany and Switzerland through face-to-face interviews with personnel managers, supplemented by secondary data analysis and expert interviews. The company interviews, which took place between 2008 and 2009, were combined with on-site visits to the production facilities. We selected the pairs by matching companies ("matched pairs") according to their 4-digit SIC codes reflecting their product lines and production technologies. To further improve the matching, we asked the companies for their main competitors and included the competitors in the analysis.

Since differences between economic sectors exist within a country (Allen, 2004), we focused on engineering because of its importance to the dual apprenticeship training system and to the national economy as a whole. We chose the subsectors pumps and turbines as the main SICs. The engineering industry subsectors account for 0.12% of the employment in Switzerland and 0.3% in Germany (see also Chapter 2). Overall, 10 comparable engineering plants[39] provided the necessary information. The limited number of Swiss engineering companies available led to the inclusion of the additional subsector of compressors, which resembles the pump and turbine companies to a very large extent in terms of its skill requirements (also reflected in the SIC code, which is close to that of pumps). For an overview of the country and sector distributions see Table 3-1.

[38] We make no statement about the relative size of external recruitment—which still might be necessary to acquire new ideas or special qualifications.
[39] In the following, we use the terms "plant" and "company" synonymously.

Table 3-1: Number of participating companies in the engineering sector

Sector	Subsector	SIC 1987	GER	CH	both
Engineering	Pumps and pumping equipment	3561	3	2	5
	Turbines and turbine generator, sets Air and gas compressors	3511, 3563	2	3	5
	All engineering subsectors		5	5	10

Source: Ryan et al., 2011, part of table 1

We focused on medium- and large-sized production plants. Using the EU classification (European Commission, 2005), the sample includes 8 large companies with 250 or more employees (5 in Germany, 3 in Switzerland) and 2 medium-sized companies between 50 and 249 employees (2 in Switzerland, Ryan et al., 2011, part of table 4). Therefore, the German sample has a higher median number of employees (500) and a higher average employment (997) than the Swiss sample (a median of 252 employees and an average employment of 347). Most of the production plants were establishments of large international companies, accounting for 6% and 15% of the total numbers of employees. The following analyses refer to the interviews with the personnel managers conducted at the production plants.

3.3.2 Comparison of personnel strategies

To compare personnel strategies, we asked about a company's sources of skills when filling vacancies for skilled production workers: "How do you typically fill your vacancies for skilled production workers"? Companies answered: "X% of vacancies at skilled production worker level are usually filled externally; (1-X%) of vacancies at skilled production worker level are usually filled internally, Y% of vacancies at skilled production worker level are usually filled by apprenticeship graduates".

As shown in Table 3-2, German companies use apprenticeship graduates to fill, on average, 40% of their vacancies for skilled production workers. The high rate of takeover offers by the companies (99% of the apprentices were offered a contract) underscores the importance of own apprentices. In contrast, external recruitment is of less importance both at the skilled worker (48%) and at the supervisory (18%) levels. Swiss establishments, on the contrary, have set different priorities in their personnel strategies: only 17% of the vacancies for skilled production workers are filled with their own apprenticeship graduates. This small share of internal recruitment cannot be explained by a low amount of own apprentices as only 57% of the graduates are offered a job. The 57% reflects almost exactly the actual takeover

rate of apprentices because 98% of the apprenticeship graduates who are offered a position accept it (thus, the almost 57% hired account for the 17% of the vacancies filled).

Table 3-2: Sources of skills and labor turnover

	Occupational category	Germany	Switzerland
Percentage of external recruitment[1]	Skilled production worker	48	77
of them trainees[1]		2	7
	Supervisory level in production	18	55
Percentage of own apprentices[2] recruitment	Skilled production worker	40	17
Apprentice job offer ratio[3] (%)	Skilled production worker	99	57
Percentage of apprentice accepting job offer[4]	Skilled production worker	100	98
Labor turnover (p.a.)[5]	Skilled production worker	2	4
Percentage of apprentices in production[6]		9	15
Number of companies		5	5

Source: Ryan et al., 2011, Table 14, extended

Notes: unweighted averages across production plants

1) Percentage of all frontline skilled vacancies typically filled by external recruitment (in the previous year or a longer period where necessary). External recruitment includes both occupationally qualified workers and unqualified workers (second line) who have only received on-the-job training or a 2-year mini-apprenticeship.

2) Percentage of frontline skilled vacancies typically filled by the establishment's own (recently or a longer period) completed apprentices

3) Percentage of apprentices offered an employment contract (any duration) upon completion, previous year

4) Percentage of apprentices accepting an employment contract offer

5) Labor turnover in 2007, retirements excluded

6) Number of apprentices in apprenticeship programs for skilled manual occupations (thus apprentices in the production-related area) to the number of employees in production.

In general, two possible reasons exist for the comparatively small takeover rate of Swiss companies. First, the companies do not make a contract offer because they have no need for employees at the time of graduation. Second, the apprenticeship graduates leave the establishment voluntarily (for reasons the companies mentioned such as further studies, military service, or employment with another company, among others). The border between the voluntary mobility of apprentices and a low takeover offer rate by the companies is fluid: many firms enquire long before the apprentice's graduation as to his or her future plans and do not offer a contract when the apprentice signals that he or she wants to leave. However,

most of the companies stated that they voluntarily let their apprentices leave the company.[40] Accordingly, in the Swiss companies externally recruited employees fill approximately 77% of the vacancies for skilled production workers.

The companies had no information on the share of (Swiss) apprentices who graduated and stayed in the educational system after their apprenticeship training, finished an additional degree (i.e., a professional qualification or possibly further studies at a university) and then returned to their training company. However, at the master level, only two out of five Swiss establishments have a current stock of employees that consists primarily of former apprentices, thus indicating a relatively small importance of returnees for filling vacancies. In the other three Swiss companies, only a minority of 33%, 25%, or even 0% of the employees at the master level consists of former apprentices. The stronger focus on external recruitment at the supervisory level is reflected not only in the stock of supervisors, but also in the recruitment strategy: 55% of Swiss supervisors are recruited from the external market emphasizing the low importance of internal career ladders.

These large differences between the personnel strategies of Swiss and German companies raise the question as to their causes—especially against the background of the similarities in the apprenticeship systems previously elaborated.

3.4 Hypotheses

To investigate the descriptive findings, we derive three hypotheses focusing on labor market institutions and their influences on apprenticeship-related issues that might affect a company's personnel strategy[41].

(1) Despite all of the previously discussed conceptual and practical similarities, apprenticeship training in Germany might be more company-specific than in Switzerland (because of the difference in the distribution of power among the institutions involved in the design of apprenticeship training programs, namely employers' associations and unions), which might—according to Becker's (1964) human capital theory—offer an incentive to German (Swiss) companies to draw more (less) on their own apprentices for filling vacancies.

[40] The different apprentices' turnover figures are also reflected in representative surveys: the retention rate after one year across all sectors in Switzerland is significantly lower (37%, Mühlemann et al., 2007) than that in Germany (55%, Schönfeld et al., 2010).

[41] Due to the fact that the supply of young people to VET is at a very high level in both countries (see Chapter 2), we do not elaborate further on this aspect.

(2) A second aspect of the human capital theory focuses on the costs of training and the question of who has to bear these costs. Labor market institutions, such as trade unions with their influence and goals, and company-level employee representation could affect how training costs are shared between the training company and the apprentice. With a high share of training costs, companies would take over a higher percentage of apprentices, which could, in turn, affect the availability of skilled employees in the external labor market and thus the attractiveness of external recruitment.

(3) Finally, the incentives for companies and apprenticeship graduates set by existing labor laws, i.e., "employment protection," could be different in Germany and Switzerland. A higher degree of employment protection in Germany than in Switzerland would increase the attractiveness of internal labor markets for companies and employees in Germany in comparison to Switzerland.

The following section analyzes the data from the country-comparison project to determine whether or not the companies behave conform to the hypotheses elaborated above.

3.5 Discussion of the hypotheses

3.5.1 Human capital acquired during apprenticeship training

To explain the comparatively high use of the companies' own apprenticeship graduates in Germany to fill skilled production worker vacancies, we first analyze whether differences in the specificity of the skills acquired during the apprenticeship training exist and whether these differences can explain the empirical puzzle (Becker, 1964).

As previously mentioned, apprenticeship training takes place in two learning environments: at school and within the company. The school-based part targets on teaching general knowledge (Becker, 1964; e.g., general mathematical skills) and broad occupation-related theoretical knowledge that is portable across companies (Stevens, 1996, 1999). The skills acquired in the company-based part may include also company-specific knowledge. Of course, training companies have to ensure that they teach the skills described in the "occupational profiles", thus ensuring their portability between different companies within the same occupational field. However, apprentices automatically acquire firm-specific knowledge during the company-based training, for example, by using special production machines or by being integrated into firm-specific organizational processes. The training companies, therefore, benefit from taking over their apprentices after graduation by saving on time and initial training costs. Consequently, companies should have a growing interest in filling

vacancies with their apprenticeship graduates with an increasing amount of company-based training (Becker, 1964). Taking the descriptive results into account, one would expect that apprentices in Germany acquire more company-specific skills than apprentices in Switzerland. The overall length of apprenticeship training, the integration of apprentices in the production process, and the share of company-based training are possible influence factors on the amount of company-specific skills.

We focus first on the overall length of the apprenticeship training. In the apprenticeship occupations relevant to this study (e.g., polymechanics), the overall length of the apprenticeship training is four[42] years in Switzerland and three and a half years in Germany. Therefore, both the school-based and the company-based training periods are longer for the Swiss apprentices than for their German counterparts. Second, Swiss apprentices are used more productively during the company-based training and are more integrated into the organizational processes (see the study of Dionisius et al., 2009, which compares 3-year apprenticeships)[43] and are thus expected to acquire more firm-specific knowledge. At the same time the Federal Vocational and Professional Education and Training Act in Switzerland requires industry courses at industry training centers (two weeks per training year) for all apprentices (thus, three training places actually exist in the Swiss system). In these industry courses, apprentices acquire basic occupational skills complementary to the skills they learn at school and in the training company (OECD, 2009a). On the one hand, these skills prepare apprentices for the production process and therefore allow a smoother integration of apprentices (see Franz & Soskice, 1995, for a discussion of the complementary relationship between general and specific skills). On the other hand, the courses reduce the time that apprentices spend at the company and provide them with highly transferable knowledge.

Interim conclusion 1: From a human capital theory point of view, we find no clear differences in the specificity of the skills acquired during apprenticeship training between Germany and Switzerland that could explain the differences in the personnel strategies of German and Swiss companies. Taking the training institutions and regulations into account, we find no indication that the German apprenticeship training is more specific than its Swiss counterpart. Given the stronger productive usage of Swiss apprentices rather the opposite

[42] Some apprenticeships in engineering last only three years, e.g., mechanical technician ("Mechapraktiker"); however, these 3-year apprenticeships were rare in our Swiss company sample.
[43] Both facts underscore the strong influence of employers in Swiss apprenticeship training (OECD, 2009a: 16, "VET system is strongly employer-driven")

seems to be true instead. However, companies might be less interested in the specificity of training and more interested in the costs associated with training. The following section discusses the cost-benefit aspect and the associated roles of labor market institutions in greater detail.

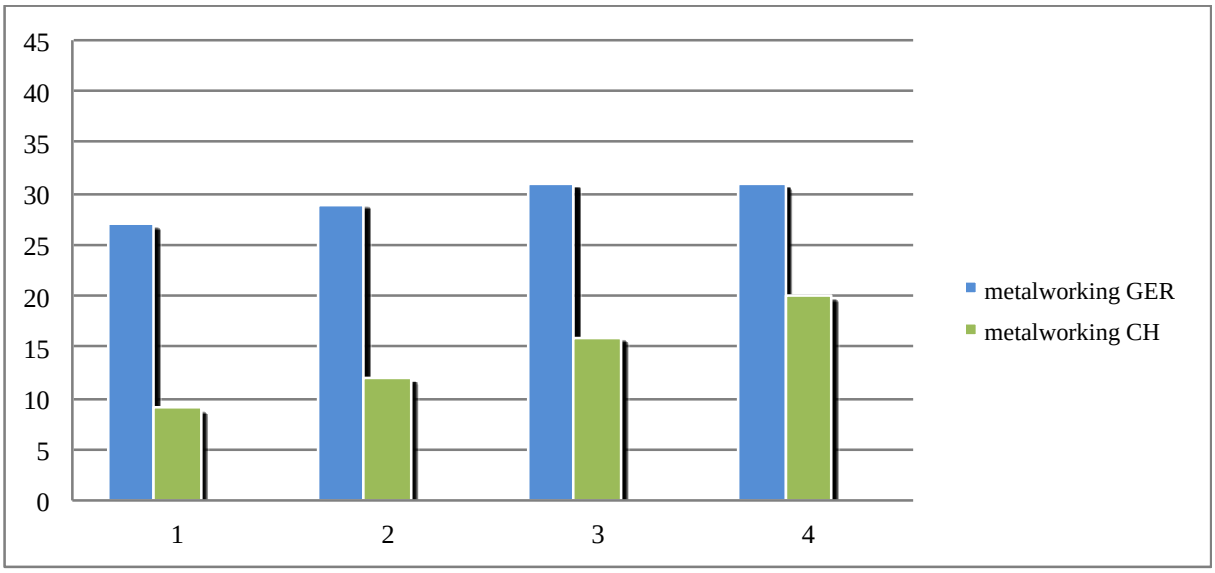
3.5.2 Training costs, labor market institutions, and their effects on (internal) labor markets

Labor market institutions might have an effect on personnel strategies by influencing how costs and benefits of apprenticeship training are shared between the training company and the apprentice. In the case in which both the company and the apprentice invest in training, both have an incentive to stay together. In the case in which only the apprentice invests, the company has no major interest in retaining the apprentice.

Cost-benefit studies comparing German and Swiss apprenticeship training programs have shown that German training companies have to bear higher net costs than their Swiss counterparts (Dionisius et al., 2009; see also Wenzelmann et al., 2009; Mühlemann et al., 2007). An important part of apprenticeship training costs is the pay of the apprentices (relative to the skilled employees' wages). One might expect similar relative apprentices' pay in Germany and Switzerland given the similar training contents and design. However, the data from national cost-benefit studies and our company sample indicate that apprentices' relative pay is significantly lower in Switzerland compared to Germany (Wenzelmann et al., 2009; Mühlemann et al., 2007; Ryan et al., 2011, Ryan et al., 2010b). This applies both to the apprentices' relative base pay and relative earnings.

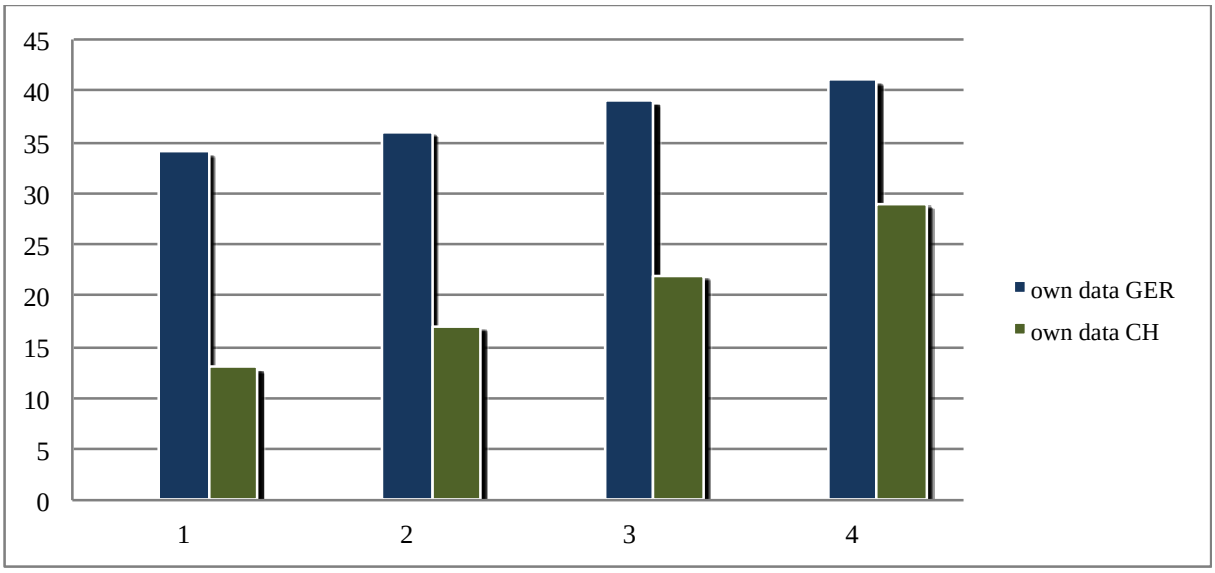
National cost-benefit studies demonstrate that Swiss apprentices in the metalworking sector earn, on average, only half of the relative base pay of their German counterparts across all training years. These strong differences also apply to the relative earnings. The results of our survey confirm the national-level findings. Figures 3-1 and 3-2 present the relative pay and Figures 3-3 and 3-4 present the relative earnings of German and Swiss apprentices by apprenticeship year (abscissa). In Figures 3-1 and 3-3, bars are based on national figures, in Figures 3-2 and 3-4, bars compare the figures provided by our company sample. Although the companies in our sample pay their apprentices more than the country average (apparent when comparing Figure 3-1 with Figure 3-2, and Figure 3-3 with Figure 3-4), the pay differences between the countries remain constant, both in terms of the relative base pay and relative earnings.

Figure 3-1: Pay of apprentices as % of the pay of skilled employees in the relevant occupations according to the national statistics



Data Source: Ryan et al., 2011, Tables 23/24, unpublished data from the 2007 BIBB survey (Wenzelmann et al., 2009) and the second cost-benefit survey research center for economics of education from the University of Berne (Mühlemann et al., 2007)
Notes:
National figures: base pay is defined as mean monthly pay, excluding social insurance contributions (employers and employees), additional monthly payment, bonus, and overtime. Data for DE and CH are for firms that trained apprentices at the time of the survey. Training occupations: mechatronic technician, industrial mechanic, electronics technician, operating technology (GER); polymechanics, electronics technician (CH)

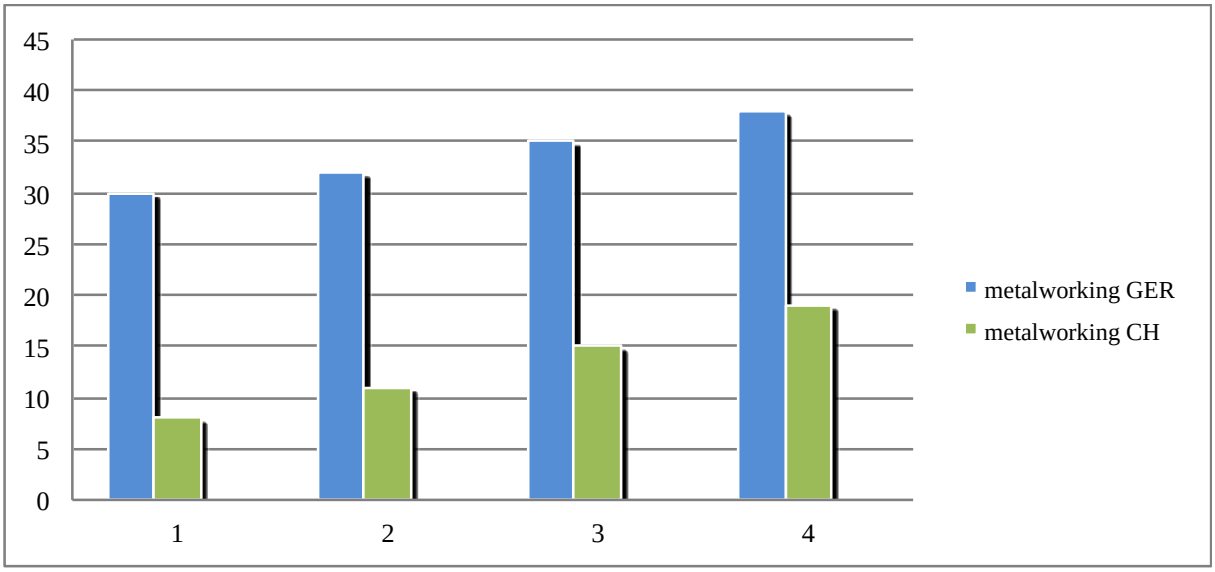
Figure 3-2: Pay of apprentices as % of the pay of skilled employees in the relevant occupations according to the company sample



Data Source: Ryan et al., 2011, Table 25
Notes:
Company sample figures: base pay is defined as mean monthly pay; includes 13th month pay and holiday pay where paid, excludes bonuses.

The difference between the German and Swiss apprentices is particularly large in the first two years and becomes smaller in the third and fourth year. While the German apprenticeship wages start at a high level and increase only a little by the end, the comparatively low level of the initial Swiss apprenticeship wages and their relatively larger increase toward the end of the apprenticeship period reflects the fact that apprenticeship wages in Switzerland are more strongly related to the apprentices' productive contributions[44].

Figure 3-3: Earnings of apprentices as % of the earnings of skilled employees in the relevant occupations according to the national statistics

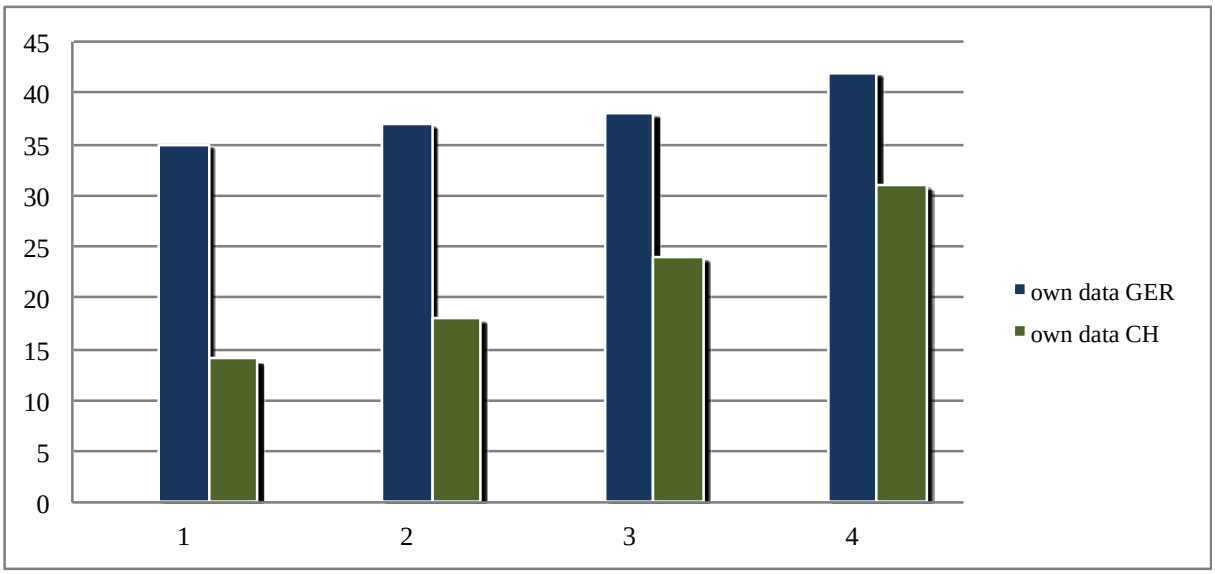


Source: same as Figure 3.1

Notes:
National figures: earnings are defined as average monthly pay, including social security contributions (employers and employees), additional month(s) pay, and (only in Switzerland) bonus pay. See also notes of Figure 3-1.

[44] In general, an apprentice's productivity is very low in the first two years as the apprentice is only slightly productively involved in the shop-floor production process and mainly receives basic training instead. In our sample, two German and two Swiss companies sent their apprentices to (independent or company-owned) training centers, where they acquire basic theoretical and practical occupation-specific skills, for the first one to two apprenticeship years (see classification Walther, Schweri & Wolter, 2005: 256). In the third and fourth year, all apprentices were involved in the production process. By the last year, an apprentice's productivity has increased to up to 90% of a skilled employee, according to our Swiss interview partners.

Figure 3-4: Earnings of apprentices as % of the earnings of skilled employees in the relevant occupations according to the company sample



Source: same as Figure 3.2
Notes:
Company sample figures: earnings are defined as mean monthly pay, including 13th month pay, holiday pay and bonus pay, but not overtime pay. Only three German companies could provide their earnings figures

To explain the differences in the relative apprenticeship pay, we focus on the institutional aspects of wage setting[45]. At first glance, several similarities in the investigated subsectors exist: as in Germany, Switzerland has a collective bargaining agreement ("Gesamtarbeits-vertrag") for the mechanical and electrical engineering industries ("Maschinen-, Elektro- und Metallindustrie—MEM") negotiated among the employer's side (represented by the employers' association Swissmem), the employees' side (represented by multiple employees' associations: Employees Switzerland ("Angestellte Schweiz"), the Swiss Commercial Association ("Kaufmännischer Verband Schweiz"), the Swiss cadre organization ("Schweizerische Kader-Organisation"), and the trade unions Unia and Syna. Approximately 590 companies and 101.500 employees (about 37%[46] of the employees in the MEM-sector) are covered (Unia, 2009). However, the collective bargaining agreement in the Swiss engineering sector leaves pay to individual agreement between the employer and employee (ASM et al., 2006: Art. 15.2) and does not include clauses that set definite values for employees' wages or apprenticeship pay[47].

[45] For further influences on the wage differences, see Ryan et al. (2010b).
[46] Part-time employees were converted to full-time employees
[47] Instead, the collective bargaining agreement in the mechanical and electrical engineering industries includes regulations on the annual amount of work time, holidays, wage replacement benefits in the

In contrast, the German collective bargaining agreement ("Tarifvertrag") is wage-relevant both for employees and apprentices. In the German engineering sector, approximately 64% (Tijdens & van Klaveren, 2007) of the employees are covered by the collective bargaining agreement. All of our German companies are covered by a regional collective bargaining agreement. While German employee and apprenticeship wages are, therefore, determined simultaneously and at a regional level[48], Swiss employee[49] and apprenticeship wages are usually set at the company level, independently from each other. Swiss employers use non–binding guidelines for the apprenticeship pay provided by professional associations (e.g., the Swiss Commercial Association, "Kaufmännischer Verband Schweiz") or by the cantonal offices for the intermediate and vocational schools; in the end, however, the training company takes the final decision.

Determining the employee and apprenticeship pay separately leads to a decoupled increase of apprenticeship pay, as the results of our survey demonstrate. Apprenticeship pay has not been raised simultaneously with the employee wages by any of the interviewed Swiss companies (Table 3-3). In contrast, apprenticeship pay increases by the same percentage as the pay of employees in the German companies which are covered by the collective bargaining agreement.

case of illness or accident, maternity leave, further training, and participation in the company (ASM et al., 2006).

[48] In addition, companies that are not covered are affected by the agreement: they have to pay at least 80% of the negotiated apprenticeship pay (BMBF, 2008).

[49] In Switzerland, the coordination of employee wages takes partly place by wage surveys, for example, conducted by employers' associations (Swissmem and Swissmechanic). The results are provided to the participating companies upon request.

Table 3-3: Union recognition and apprentice pay setting

Number of establishments with attribute

		Collective bargaining agreement[1]	Employee representation[2]	Setting of apprentice pay collectively negotiated[3]	Same pay raise as employees[4]	Number of companies
Engineering	DE	5	5	5	5	5
	CH	0	4	0	0	5

Source: Ryan et al., 2011, parts of Tables 19 and 22

Notes:

1) Company belongs to a wage-relevant industry-wide collective bargaining agreement.

2) "Betriebsrat" in Germany or "Personalkommission" in Switzerland.

3) Apprenticeship wages are set by industry-wide/regional collective bargaining agreements.

4) Apprentices receive the same (usually, in terms of percentage) increase at the same time as the regular employees in the same occupation.

The relatively low level of apprentices' pay in Switzerland compared to Germany can also be traced back to differences in the major aims of the unions. In our interview with a Swiss labor union representative responsible for youth activities in one of the most important unions in the Swiss MEM sector (with 20.000 members in this sector and involved in the collective bargaining negotiations), the interviewee told us that their primary goal is a sufficient volume of apprenticeship training, which could be endangered by higher apprenticeship pay.

The explicitly mentioned major aims of the labor union illustrate the different logic of the apprenticeship systems in Germany and Switzerland, which is also reflected in the national cost-benefit studies (Mühlemann et al., 2007; Schönfeld et al., 2010). While the institutional setting in Switzerland allows for lower training costs[50] to employers, the goals and the greater influence of the German unions has led to a situation in which German companies bear comparatively higher training costs than their Swiss counterparts[51]. The impact of this cost difference is also potentially reflected by the higher apprenticeship rate in Swiss companies (15%) compared to that in German companies (9%).

The higher net costs for German companies can explain the high rate of takeover offers to apprentices in Germany (99%) and the comparatively low rate of takeover offers to apprentices in Switzerland (57%). German companies rely to a larger degree on the post-

[50] However, this difference in focus is not at the expense of training quality (see the similarities between apprenticeship training systems previously described).

[51] Besides the lower pay, the cost difference results from the previously mentioned higher productive assignment at the workplace and the longer training period in the last year, during which the apprentices are the most productive (see, notably, the survey of Dionisius et al., 2009, who show the determinants of cost differences and their relevance for a 3-year apprenticeship).

training benefits than their Swiss counterparts (Mühlemann et al., 2010). Furthermore, this takeover behavior has important implications for the existence and attractiveness of an occupational labor market as shown by Acemoglu and Pischke (1998).

Acemoglu and Pischke (1998) argue, for the German case, that training companies become aware of their apprentices' true ability[52] during the apprenticeship training. This information allows the company to offer low-ability workers a wage equal to their productivity. Therefore, mainly a negative selection of apprentices leaves the companies, as the average market wages are higher (as this wage reflects the expected ability of the workers available on the market). Good apprentices are offered the market wage (or a little more) by their training companies and thus would experience a wage loss when leaving the company. Therefore, good apprentices have an incentive to accept the employment offers from their training companies.

However, these information asymmetries in terms of apprentice abilities should not differ between Germany and Switzerland. What differs, however, is the need of German companies to retain their apprentices to cover the apprenticeship training costs. Therefore, most of the apprentices including also some that may perform less well are still retained and only the worst selection leaves[53]. In contrast, the Swiss companies interviewed explained that they let their apprenticeship graduates leave because they would not have had an open position at the time of graduation (see the discussion on "long-term personnel planning" in the next section). Therefore, the separation between the apprentice and the training company is not necessarily associated with a low ability of an apprentices but a lack of a vacancy for a skilled production worker at the time of graduation. The companies can afford not to retain their apprenticeship graduates for times of staff demand as their training costs are comparatively lower.

In sum, all of the factors discussed above lead to the surprising combination of low apprentice takeover and high external recruitment in Switzerland. The reduced danger of a negative selection and the higher volatility on the market of apprenticeship graduates (see takeover rates) cause the external recruitments of skilled employees to be more attractive in

[52] In contrast to Katz and Ziderman (1990), who focus on the information asymmetry in the amount and quality of training a worker receives. However, this explanation does not fit well with the highly regulated and externally certified case of the German and Swiss apprenticeship training systems.

[53] Of course, exogenous separation also occurs (Wolter & Ryan, 2011), and not all apprentices accept a company's contract offer. However, our figures show that almost all apprentices in Germany do accept the contract offers.

Switzerland than in Germany and offer companies the possibility to recruit personnel when needed instead of keeping employees on stock.

In addition, the collective bargaining agreement in the Swiss engineering sector provides the necessary freedom to the Swiss companies to decide whether and how many apprentices they would like to take. The apprentices and the company sign an apprenticeship contract that automatically ends after the successful completion of the final examination. The company has no legal obligation to take over the apprenticeship graduates. The same applies in principle to Germany. However, a wide range of German collective bargaining agreements tries to influence the takeover behavior of companies. In 2005, 121 agreements on collectively negotiated measures to foster training ("Vereinbarungen zur tariflichen Ausbildungsförderung") existed (partly, also in the engineering sector, IG Metall, 2005). 96 regulations covering 7.8 million employees included regulations on the takeover behavior of companies (Beicht & Berger, 2006). The takeover period is usually half a year or a whole year. No comparable regulations exist in the collective bargaining agreements in Switzerland; the takeover decision is left to the company.

In addition to the regulations in the collective bargaining agreements, influential German works councils also play a major role in the takeover behavior of companies. As Soskice (1994) has already argued, works councils have little interest in replacing their own apprentices with external skilled employees and use their influence to assert their claims. A current example is the pressure of the Bosch works council in Feuerbach (Baden-Wuerttemberg). As Bosch offered only 30 of its 104 apprentices a permanent contract (the remaining apprentices were offered a temporary contract) the works council organized a daily "solemn vigil" supported by the union IG Metall. The works council objected because Bosch recruited 80 temporary employees the month before. The company reacted to the pressure; negotiations were conducted, and the company conceded (Stuttgarter Nachrichten, 1.12.2010)[54]. In the Bosch plant in Reutlingen, the works council enforced the takeover of 35 apprentices even though the company planned no takeovers at all. More than 1000 employees supported the apprentices' request (IG-Metall, 2011). Furthermore, besides protests, works councils can refuse to agree on new hires, according to §99, II, 2 BetrVG, and signal to the employer that the takeover of apprentices has the highest priority (IG-Metall, 2001).

[54] The chairman of the group works council, Alfred Löckle said: "In such a situation, one cannot recruit externally, instead of giving all own apprentices permanent contracts". – „Aber man darf in so einer Situation doch niemanden von außen einstellen, statt die eigenen Auszubildenden komplett unbefristet zu übernehmen."

In our sample, some companies explicitly told us that they feel pressure from the works council to takeover all apprentices (which is consistent with the results of Kriechel et al., 2011). During recent years, works councils have even had agreements to give apprentices unlimited contracts[55], raising the problem that the companies have to keep positions open for the apprenticeship graduates even when these have to go into the military service. The issue of taking over all apprentices is at the top of the works council agenda. One German company told us that the works council would like the company to train more apprentices; however, their first priority is that all apprenticeship graduates receive a contract[56]. This institutional pressure contributes to the fact that German companies have a long-term personnel planning[57]. In contrast to the response from the Swiss companies that they had no open positions for apprentices at the time of their graduation, the German counterparts had to plan in advance to keep positions open for the apprentices.

Employee representation in Switzerland plays a comparatively minor role (ICTWSS database, 2009). The employee representation of the interviewed Swiss companies (four out of five companies had an employee representation) is mainly a "communication channel" between the management and the employees. In two of four companies with employee representation, the "Personalkommission" is involved in the setting of employees' wages. Nevertheless, the employee representation does not play an explicit role in deciding whether apprentices are taken over or whether employees are recruited from the external market. Therefore, Swiss companies have—in contrast to their German counterparts—freedom of action regarding their personnel strategies.

Interim conclusion 2: Labor market institutions (trade unions, works councils, and collective bargaining agreements) enclosing the apprenticeship system have a crucial influence on the personnel strategies of companies. The institutional setting in Germany leads to comparatively higher net costs. Therefore, companies need to retain their apprentices to

[55] One personnel manager told us: "The works council always participates in the hiring process. (…). There has been a commitment due to the works council agreement that all apprentices have to be taken over for one year. This commitment has now been changed to give them unlimited contracts."

[56] These statements contrast the previously described priorities of Swiss unions. In addition, these statements are consistent with the results of Backes-Gellner, Frick, and Sadowski (1997) who found that there was a lower proportion of apprentices per employee in companies with a works council than in companies without a works council.

[57] This is consistent with Freeman and Lazear's (1995) finding that works councils lead to a long-term perspective of workers (Hirsch, Schank, and Schnabel, 2010, find a lower separation rate in companies with works councils compared to companies without works council). Therefore, companies with a works council invest more in firm-specific and general human capital. This investment leads to higher net training costs and reinforces the process previously described.

amortize their net costs. Even if the company could afford to let the apprentices leave, collective bargaining agreements and works councils work toward achieving a high takeover percentage. By contrast, Swiss companies can more likely afford—both regarding the financial and institutional pressures—to train over their needs and let apprenticeship graduates leave for the external labor market, which is thus an attractive skill pool when new personnel is required.

3.5.3 Employment protection and classification of Switzerland and Germany in the international context

Finally, we analyze the incentives for companies and apprenticeship graduates set by existing labor law, i.e., "employment protection". We expect that a higher degree of employment protection will lead to a stronger focus of companies and employees on internal labor markets, as shown by previous literature. Several authors (e.g., Cappelli, 2004; Acemoglu & Pischke, 1999; Harhoff & Kane, 1997) refer to search and matching frictions as an incentive to invest in general training (such as apprenticeship training) because it serves as a screening device for future employees, and a high level of employment protection increases this incentive. High employment protection hampers (by high firing costs) dismissals of employees that have proven to be a poor match to the company. Therefore, selecting future employees from the pool of apprentices during the training period is less risky than recruiting employees from the external market, in particular, in countries with high levels of employment protection because the apprenticeship contract automatically ends with an apprentices' graduation and does not require any additional dismissal costs.

The OECD's index on employment protection (2008) indicates a significantly higher level of protection for permanent employees against dismissal in Germany than in Switzerland. German permanent employees have the third highest employment protection rating among all OECD-countries (the German value is 2.85 on the OECD index, which is scaled from 0=least stringent to 6=most restrictive). Switzerland has the fourth lowest employment protection rating in the OECD area (OECD index value of 1.19). The reasons for the large differences in employment protection (and therefore firing costs) are procedural issues. While Swiss companies can terminate an employment contract simply by a written statement, German companies have to provide reasons for dismissals: the dismissal must be socially justified; third parties such as works councils have to be informed; and if the employee can be transferred to another position within the company, he or she cannot be

dismissed (German dismissal law, "Kündigungsschutzgesetz"). For German companies, the high firing costs (and the high search and selection costs that occur due to the anticipated dismissal costs) increase the attractiveness of internal recruitment by taking over already screened apprenticeship graduates and filling a high share of skilled worker vacancies with them.

The German combination of high employment protection and of other labor market institutions (unions, works councils) are complementary in the sense that they both push for a high takeover rate of apprenticeship graduates and long-term personnel planning. This complementary relationship is the result of previous developments such as the successful push by unions for higher employment protection (1951 Dismissal Protection Act, see Emmenegger & Marx, 2010).

Employment protection creates complementary incentives for companies and employees. For employees in Germany, a long tenure and a long-term investment in company-specific knowledge are rational (Estevez-Abe, Iversen & Soskice, 2001; Wasmer, 2006). A high level of employment protection functions as insurance that the employees can reap the returns on their investments in company-specific skills. In contrast, due to the low level of employment protection in Switzerland and the associated low job security with a company, employees in Swiss companies will invest less in company-specific knowledge and try to accumulate more occupation-specific knowledge by changing companies. Therefore, we find that the higher turnover of Swiss apprenticeship graduates is embedded in an overall environment of higher mobility. Our data show a labor turnover of 4% in Swiss companies compared to 2% in their German counterparts[58]. The higher volatility of the Swiss occupational labor market increases the appeal of external recruitment by reducing the searching cost to find an appropriate person.

Interim conclusion 3: Germany and Switzerland differ significantly in their degree of employment protection, thus providing different incentives to employees and companies. Under high employment protection regulations such as those in Germany, both employers and employees focus on internal labor markets. However, when confronted with a low level of employment protection such as in Switzerland, employers focus more strongly on external recruitment, while employees exhibit higher mobility.

[58] Our figure for Switzerland is even smaller than the average labor turnover in the Swiss MEM sector (8.9%, see Henneberger & Sousa-Poza, 2007). Unfortunately, no comparative figure for the German engineering sector exists according to the German Federal Statistical Office.

As our two-country comparison suffers from a small dataset, we embed our results in a broader context to examine their plausibility. Therefore, we use the VoC approach (Hall & Soskice, 2001), which classifies countries according to their institutions (among others the education and training system and industrial relations institutions) as either liberal (main example: USA) or coordinated market economies (main example: Germany). In liberal market economies, employment protection is low, no industry-wide wage agreements exist, and employee representation is rather weak. Coordinated market economies show a high degree of codetermination via industry-wide wage agreements, influential trade unions and works councils, and are characterized by high employment protection.

The institutional setting has important labor market and training consequences. In liberal market economies like the U.S., the individual has the responsibility to acquire general skills and has to bear the associated training costs. The U.S. labor market at the national level is characterized by high labor turnover, and companies show no affinity for long-term personnel planning but adjust their labor force by reducing the number of employees if necessary and recruiting external employees if a need for them arises (Houseman & Abraham, 1995; Hall & Soskice, 2001).

The cluster analyses of Paunescu and Schneider (2004) show that Switzerland (at the national level) has a strong tendency toward a liberal market economy. For 1999, the authors even categorize Switzerland in the same cluster as the U.S. Certainly, the VET system differs significantly between Switzerland and the U.S. However, the Swiss labor market institutions resemble more the U.S. than Germany. Therefore, the higher investments of Swiss apprentices compared to German apprentices in (at least occupationally) transferable human capital among others via lower relative pay follows the logic of a liberal market economy. Additionally, the behavior of companies to rely to a high degree on external recruitment instead of long-term planning with their own apprentices reveals similarities to the behavior of U.S. companies. The higher fluidity of the (occupational) labor market completes the picture.

In contrast, Germany not only exhibits features of a coordinated market economy, but also tends—especially in the first years[59] after the apprenticeship—toward a segmentalist system with strong internal labor markets (Thelen & Kume, 1999; Thelen & Busemeyer, 2011). The generally accepted apprenticeship certificate should enable mobility; however, it

[59] In the following chapter, we analyze whether the focus on internal labor markets continues at a higher hierarchical level.

serves—at least in our sample—more as "insurance" (Soskice, 1994). In addition, the long-term personnel planning of German companies, the comparatively low labor turnover, the high takeover rate of apprenticeship graduates, and the low level of external recruitment correspond well to Japan's segmentalist system. Therefore, our results are consistent in an international context.

3.6 Conclusions and limitations

The results of our matched-pair study show that Swiss engineering companies draw—compared to their German counterparts—to a surprisingly low extent on their own apprentices to fill vacancies for skilled production workers but rely on external recruitment to a large degree instead. A micro-level analysis of the human capital acquired during the apprenticeship period does not provide an explanation. However, Switzerland and Germany differ significantly in their sectoral and national labor market institutions and thus form complementary systems in themselves, which can explain the different personnel strategies.

In Germany, high net training costs (a result of higher relative training pay, among others), collective bargaining agreements, influential works councils, and a high level of employment protection serve as complements and push for a high takeover rate of apprenticeship graduates, long-term employment, and a high share of apprenticeship graduates filling skilled production employee vacancies. In contrast, Swiss companies are both financially and institutionally less dependent on the long-term employment of their apprentices. Instead, they let their apprenticeship graduates go when they have no need for them and rely on external recruitment in times of demand of employees. The low level of employment protection in Switzerland is complementary to this strategy.

Our study has several limitations. We cannot exclude the possibility that the results are biased in such a way that fewer apprentices than usual have been offered a contract in Switzerland because of the economic crisis in 2008 and 2009. Two arguments, however, contradict a systematic bias in our findings. First, we interviewed matched-pair companies in Germany and Switzerland that produce similar products and compete on the same markets. Therefore, an economic shock should have hit the companies in both countries to the same extent without leading to a lower takeover percentage in only one country (e.g., Switzerland). Second, the recruitment question concerning qualified employees aimed at the *usual* external recruitment. Therefore, the effects of the current economic factors should at least be smoothed.

Furthermore, our data set consists of only a few companies and does not contain non-training companies. Therefore, an integrated investigation of the effect of labor market institutions on the training behavior of German and Swiss companies is not possible (on this aspect, see, e.g., Mühlemann et al., 2010). In addition, our German companies are larger than our Swiss companies. This size difference could bias our results. We cannot exclude this possibility; however, the small company size in Switzerland may not be exogenous but may reflect the difficulty in establishing strong internal labor markets in such a liberal institutional setting.

The results provide important insights and the motivation for further research. How can Germany and Switzerland have such different labor market institutions but have succeeded in establishing such similar apprenticeship systems? How can Swiss companies with (high) training costs survive in such a liberal institutional setting (one possibility could be regional monopsonies, Mühlemann, Ryan & Wolter, 2011)? Moreover, it would be interesting to investigate if and to what extent the implications of the VoC approach can be transferred to further training because Swiss employers bear approximately 50% of the further training costs of the labor force (Messer & Wolter, 2009).

From a policy perspective, the future developments will be of major interest. Since the number of young people is decreasing due to demographic changes, it remains to be seen whether Swiss companies increase the takeover rate of apprentices and thus their internal recruitment. Additionally, the wages of apprentices (and, therefore, the company's training costs) may be increased in the future to attract a sufficient number of applicants. Furthermore, unions have shown increased interest in demanding higher apprenticeship pay rates (20 Minuten, March 9, 2011: Gewerkschaften fordern höhere Lehrlingslöhne) and aim to include binding regulations in collective bargaining agreements. The future will show how these developments will affect the personnel strategies of Swiss companies.

After highlighting the strong effect of labor market institutions on the companies' personnel strategies at the level of skilled production employees, we investigate the effect of labor market institutions at the next hierarchical level in the following chapter. In addition, we include countries in which the VET systems differ from the German and Swiss dual apprenticeship system.

CHAPTER 4

Promotion patterns–a matter of vocational education and training and labor market institutions. An international comparison of U.S., German, Japanese, and Swiss manufacturing and retailing companies

4.1 Introduction

Internal labor markets in general and promotions in particular are widely studied in scientific fields such as economics, political science, industrial relations, and sociology (e.g., Lazear, 2000; Hall & Soskice, 2001; Marsden, 1999; Osterman, 2011[60]). The broad interest in internal promotions as one aspect of internal labor markets exists because promotion figures allow for the measurement of whether a company is attempting and succeeding in attracting and retaining loyal talents and thus company-specific knowledge by offering attractive development opportunities. Despite the valuable insights of previous research, only little empirical evidence exists on within- and between-country differences in internal labor market structures and companies' promotion patterns. Therefore, we analyze why companies' rates of internal promotion to the supervisory level are so much more prominent in some economies than in others.

In doing so, we draw on the economic and institutional literatures. New Personnel Economics explains differences in internal labor markets from an optimization and efficiency point of view (Lazear & Shaw, 2007). Varying constraints such as differences in technologies or business cycle positions at the time of measurement may cause variation in internal labor markets. Individual preferences explain the remaining differences, which arise as a consequence of the trade-offs between the four prerequisites for internal labor markets (match-specific investments, risk aversion, asymmetric information, and transaction costs,

[60] See also Lazear & Rosen, 1981; Gibbons & Waldman, 1999a; Chan, 1996; Fairburn & Malcomson, 2001; Waldman, 2003; Marsden, 1986; Eyraud, Marsden & Silvestre, 1990; Doeringer & Piore, 1985; Dore, 1973; Hall & Soskice, 2001; Thelen, 2007; Osterman, 1994; Rosenbaum, 1984; Bruderl, Diekmann & Preisendorfer, 1991; Althauser, 1989.

Wachter & Wright, 1990[61]). However, even if companies appear to be exposed to the same economic constraints differences still remain (Osterman, 2011). In particular, individual preferences are unlikely to differ greatly by countries, thus such explanations concede ground to institutional labor economics, which considers labor markets to be "institutional phenomena" (Marsden, 1986: 231; Osterman, 2011).

Most institutional literature that focuses on internal labor markets points out the existence of complementarities among institutions such as educational (the vocational education and training (VET) system) and labor market-related institutions (such as employment protection). The Varieties of Capitalism (VoC) approach, for example, categorizes countries according to their complementary institutions and uses these categories to explain country-level differences in internal labor markets (e.g., Hall & Soskice, 2001; Thelen, 2007). While the VoC approach stays mainly at the national level, some international comparative studies focus on the company itself[62] and its promotion pattern. Eyraud, Marsden, and Silvestre (1990), for example, analyze (internal) labor markets in the manufacturing sectors in the UK and France and stress the complementary interplay among the VET system, the industrial relations systems, labor management, and labor market structures (see also Maurice, Sellier & Silvestre, 1986; Sorge & Warner, 1980; Maurice, Sorge & Warner, 1980; Marsden, 1982).

Although the economic and institutional approaches are often treated as alternatives, they are actually complements because neither stands well on its own. On one side, the economic view does not fully explain all of the (cross- and within-country) differences in internal labor markets and promotion patterns. On the other side, the institutional view seems to pay too much attention to the complementarities of VET and labor market institutions and too little on possible contradictions that arise when VET systems are analyzed economically with regard to the transferability of skills acquired from VET. A differentiated view allows us to analyze whether VET and labor market institutions have separate effects on the structure of internal labor markets and internal promotion patterns and whether these separate effects reinforce or weaken each other. A possible example for opposing effects is the combination of company-specific, non-certified VET that strengthens internal promotions according to human capital theory and liberal labor market institutions that imply that employees are less

[61] See also Becker, 1964, Gordon, 1974, Lazear & Rosen, 1981; Holmstrom, 1983; Hart & Holmstrom, 1987; Riordan & Wachter, 1982; Williamson, Wachter & Harris, 1975.

[62] Some studies compare data on wage-tenure profiles and turnover in companies in the U.S. and Japan but do not explicitly take the promotion behavior of companies into account (Mincer & Higuchi, 1988; Hashimoto & Raisian, 1985; Levine, 1993; Blinder & Krueger, 1996).

willing to invest in company-specific knowledge and will try to change jobs to gain a broad labor market experience and to insure against possible lay-offs.

Capturing these separate effects of VET and labor market institutions necessitates an in-depth analysis using company-level personnel records in different countries supplemented by institutional characteristics and qualitative information as requested by Baker and Holmstrom (1995). We, therefore, draw on interview data from matched-pair companies in the engineering and retailing sectors in Germany, Japan, Switzerland, and the U.S. and use qualitative and quantitative information on internal promotions, labor market institutions, and VET provided in the company.

The comparison of matched-pair engineering and retailing companies in Germany, Japan, Switzerland, and the U.S. shows that the type of VET and the type of labor market institutions have separate effects on internal labor markets as measured by the percentage of internal promotions to the supervisory level. While companies that provide company-specific and non-certified VET show a higher percentage of internal promotion than their counterparts with occupation-specific and certified VET, companies with more coordinated labor market institutions show a higher percentage of internal promotion than their counterparts acting in more liberal labor market institutions. Given these results, we find that companies in both Japan and Switzerland constitute "complementary" cases in the sense that both dimensions—VET and labor market institutions—reinforce each others' effects on internal labor markets. In contrast, German and U.S. companies constitute "mixed cases," where VET and labor market institutions weaken each others' effects on internal promotions. At least with regard to internal promotion patterns, these results contrast with previous literature that stresses the high coherence of VET and labor market institutions in Germany and the U.S. (e.g., Hall & Soskice, 2001).

The chapter is organized as follows. The next section summarizes the relevant literature dealing with internal labor markets and internal promotions in organizations. By combining economic and institutional literature, we develop an analytical matrix and derive our research hypotheses. The third section describes the data and places companies in the four countries analyzed in the quadrants of our analytical matrix. The fourth section tests the hypotheses concerning the separate effects of VET and labor market institutions on the promotion pattern of companies. The final section discusses our results and concludes.

4.2 Theoretical background and hypotheses

Our theoretical analysis of promotion patterns is based on institutional and economic literatures. We first discuss the institutional literature by presenting, on the one hand, the Varieties of Capitalism (VoC) approach, which provides a broad picture of both VET systems and labor market institutions at the country level and which highlights the idea of complementarities between these two dimensions, and on the other hand, a literature that is more case study-based and which offers a more detailed look at differences between VET systems. We then analyze the implications of the institutional literature for promotion patterns. Second, we discuss the economic literature by focusing on Becker's (1964) human capital theory and related literature that highlight the importance of the transferability of skills. We then analyze the implications of human capital theory for promotion patterns. Finally, we use insights from both the institutional and economic literatures to construct our analysis matrix that separates the influences of VET and labor market institutions and allows us to derive our hypotheses.

A large variety of labor market institutions exist (e.g., Freeman, 2008). The same is true for (vocational) education and training systems, which show a variety ranging from dual apprenticeship systems to company-specific training (see Chapter 2). In their well-known VoC approach, Hall and Soskice (2001) systemize the variation and categorize countries according to their institutional settings, which they define in terms of education and training system, corporate governance, internal structure of the firm, industrial relations, and inter-company relations. Depending on the interplay among the factors described, countries can be categorized along a continuum between "liberal" (Hall & Soskice, 2001; Streeck, 2001[63]) and "coordinated" market economies (Hall & Soskice, 2001; Soskice, 1991[64]). Typical examples of the most coherent cases of the continuum are the United States for the liberal pole and Germany for the coordinated pole.

Hall and Soskice (2001) argue that the complementarity of the institutional settings is highest in the polar cases, leading to different internal labor market structures. The U.S.'s combination of low employment protection, no obligation to establish employee representation, and little or no wage coordination (i.e., weak employer coordination and no industry-wide collective bargaining agreements) are main characteristics of the liberal category. In such a constellation, individuals have an incentive to invest in general and

[63] Also called "non-coordinated" (Soskice, 1991).
[64] Also called "socially embedded" (Streeck, 2001), see also Boyer and Hollingsworth (1997) and King and Wood (1999).

transferable skills, allowing for high employee mobility and leading to weak internal labor markets[65]. In contrast, firm-specific accumulation of knowledge becomes possible in Germany because of its combination of high employment protection, strong employee representation, employer- and wage-coordination, and the acquisition of specific[66] skills via the German VET system (dual apprenticeship training, Hall & Soskice, 2001).

The VoC approach, with its notion of coherence and complementarity, adds to our understanding of the mechanism through which labor market institutions impact internal labor markets in general and promotions in particular. A high degree of employment protection gives employees an incentive to stay with the company and to focus on company-internal careers (see, e.g. Estevez-Abe, Iversen & Soskice, 2001; Wasmer, 2006). Also the company has a high incentive to promote employees from within when employment protection is high, as an external recruitment is related with uncertainty and risk and a separation in case of a mismatch is difficult and costly. Employee representation increases tenure and strengthens internal labor markets by increasing employees' employment security and satisfaction and their willingness to acquire company-specific knowledge (see e.g. Hirsch, Schank & Schnabel, 2010). Therefore, a broad pool of possible internal successor exists. Finally, employer and wage coordination reduces the danger of poaching and the employees' incentives to change companies (see e.g., Culpepper, 2001; Hall & Soskice, 2001), which also increases the pool on internal candidates. Together, all of the labor market institutional components are complementary and the possibility of companies to rely on internal candidates when filling positions at the supervisory level.

As the VoC approach distinguishes between general and specific skills and regards apprenticeship training as specific thus contributing to strong internal labor markets, Germany is characterized as coordinated labor market economy and in the same category like Japan. However, the role of apprenticeship training – as one form of VET – for internal labor markets is controversially discussed. Marsden (1986, 1990), for example, argues that apprenticeship training is the basis for occupational labor markets. Given the standardization, thus the comparatively low firm-specificity, the breadth, the relevance, and the country-wide accepted certification of apprenticeship training, the classification of Germany with its occupation-specific and certified VET in the same category as Japan with its highly company-

[65] Therefore, industries that rely on firm-specific knowledge and strong internal labor markets, such as engineering, have institutional disadvantages in the U.S. In contrast, these companies flourish in an institutional setting such as Germany's that allows for "diversified quality production" (Streeck, 1991) through strong internal labor markets and low employee mobility (see also Chapter 5).
[66] The VoC just distinguishes between general and specific skills.

specific and non-certified VET seems puzzling. Although asymmetric information on the trainee and an adverse selection problem may reduce mobility (Katz & Ziderman 1990; Acemoglu & Pischke 1998), several studies show that such a standardized, broad, and certified kind of VET as existent in Germany enables mobility between companies and individual career development (e.g., Backes-Gellner, Mure & Geel 2011; Finegold, Wagner & Mason 2000; Crouch, Finegold & Sako 1999; Hinz 1999; Keltner, Finegold & Pager 1996; Allmendinger 1989; Marsden 1986).

To the discussion on the strength of internal labor markets and promotion patterns in different VET systems, economic literature gives valuable insights. Becker's human capital theory (1964), for example, focuses on the specificity of skills and argues that the probability of internal promotion is high when training is company-specific and when specific human capital is necessary for performing a specific task (Topel, 1991; Felli & Harris, 1996)[67]. Kahn and Huberman (1988) and Prendergast (1993) argue that also the reverse causality can explain high internal promotion: only when employees have the company's credible commitment that the investment in company-specific human capital will pay off, these investments take place. Due to the relevance of specificity and transferability of skills, economic literature clearly differentiates between firm-specific and occupation-specific training (e.g., Stevens, 1994). Occupation-specific training is much less specific to a certain company and shows higher transferability, which, therefore, has consequences for the promotion behavior of companies.

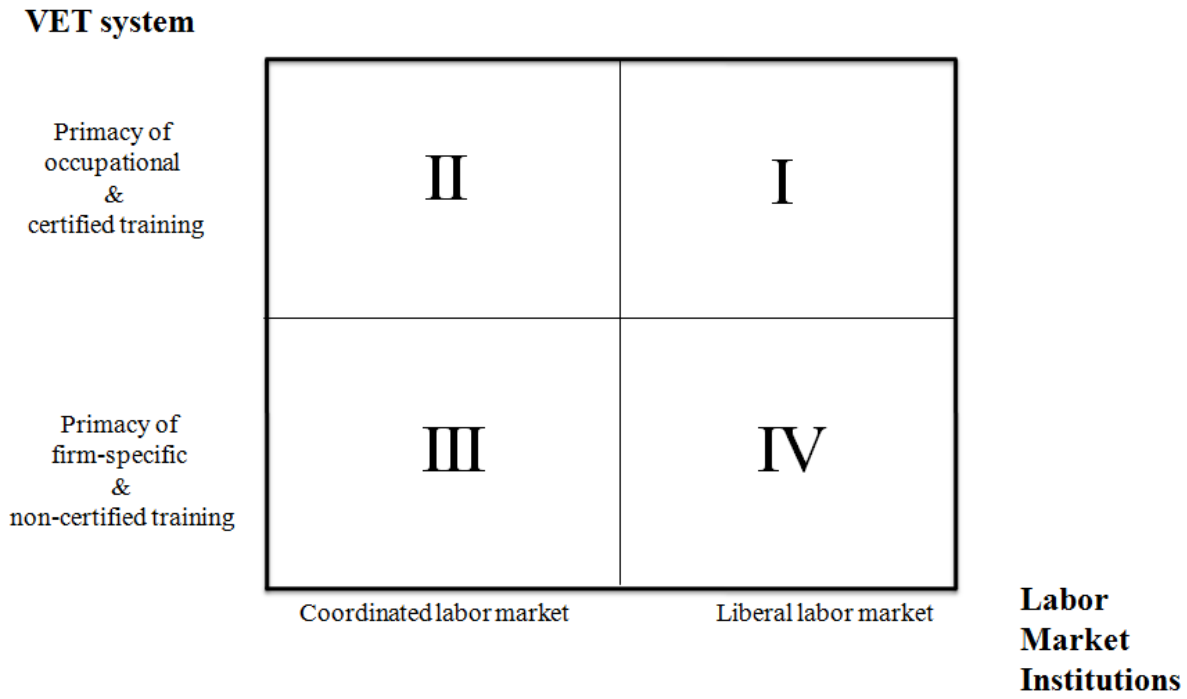
Due to structural differences in the specificity and transferability of VET, more differentiated approaches seem necessary and have partly emerged. Thelen (2007) identifies three different systems at the country level based on skill specificity, industrial relations, and labor market institutions. In addition to the liberal market economy, she differentiates within the coordinated countries between "collectivist" (occupational skills, e.g., Germany) and "segmentalist" (firm-specific, e.g., Japan) countries (see also Busemeyer, 2009 for a discussion on a new categorization of (coordinated) skill regimes using "vocational specificity of education system" and "firm involvement in skill formation process").

We follow these approaches and differentiate between "collectivist" for occupation-specific, certified and "segmentalist" for firm-specific, non-certified VET as major influence

[67] Research that focuses on individual promotion probability has also shown that training plays a major role for promotion (e.g., Pergamit & Veum, 1999; Melero, 2010). Several other articles analyze the determinants and consequences of promotions (e.g., Sicherman & Galor, 1990; McCue, 1996; Francesconi, 2001; Abraham & Medoff, 1985; using data from particular organizations Baker, Gibbs & Holmstrom, 1994; Asch & Warner, 2001; Treble et al., 2001; using data from a particular profession Broder, 1993; Spurr & Sueyoshi, 1994).

factor for promotion patterns in companies. Given the effect of labor market institutions, as shown by the VoC approach, on internal labor markets, we also differentiate between coordinated and liberal labor market institutional settings. Therefore, we create a four-field matrix with the type of VET on the y-axis and the type of labor market institutions on the x-axis (Figure 4-1) to analyze the separate effects of both dimensions on promotion patterns.

Figure 4-1: Analytical matrix



Source: own model

According to the previously described theoretical and empirical findings from the human capital literature, we derive the following relationships between VET and promotion patterns:

H1: Companies with largely company-specific and non-certified VET show a higher percentage of internal promotion than companies where VET is largely occupation-specific and certified.

We derive subsidiary hypotheses from H1:

H1a: The percentage of internal promotion in quadrant III > the percentage of internal promotion in quadrant II

H1b: The percentage of internal promotion in quadrant IV > the percentage of internal promotion in quadrant I

From the description in the previous section of the two polar cases, Germany and the U.S., we derive the following relationships between labor market institutions and promotion patterns:

> H2: Companies acting in coordinated labor market institutions show a higher percentage of internal promotion than companies acting in liberal labor market institutions.
>
> We derive subsidiary hypotheses from H2:
>
> H2a: The percentage of internal promotion in quadrant II > the percentage of internal promotion in quadrant I
>
> H2b: The percentage of internal promotion in quadrant III > the percentage of internal promotion in quadrant IV

The matrix allows us to identify four different cases, which may either be "complementary" or "mixed" in terms of the effect of the two influence factors on the promotion behavior of companies.

Company-specific, non-certified VET and coordinated labor market institutions, such as high employment protection, employee representation, and collective bargaining agreements, reinforce each other's effect because both dimensions provide incentives for strong internal labor markets and a high percentage of internal promotion (quadrant III). Similarly, occupation-specific, certified VET and liberal labor market institutions such as low employment protection, weak or non-existent employee representation, and little or no wage coordination, reinforce each other's effect because both dimensions provide incentives for weak internal labor markets and a low percentage of internal promotion (quadrant I).

However, the two dimensions can also weaken each other. Occupation-specific, certified VET enables mobility between companies and conveys only a limited amount of firm-specific skills thus decreasing the incentive to promote internally; however, coordinated labor market institutions, such as high employment protection, employee representation, and wage coordination, create incentives to stay with the company, to invest in firm-specific skills, and to strive for a firm-internal career (quadrant II). Similarly, company-specific, non-certified VET incentivizes the company and the employee to create and follow internal careers; however, liberal labor market institutions, such as low employment protection, non-existent employee representation, and little or no wage coordination, encourage employees to

leave the company to gather further experience and thus insure against the danger of layoffs (quadrant IV). We investigate these relationships with the data described in the following section.

4.3 Data and company categorization

We use data gathered via interviews with personnel and plant managers in the engineering and retailing sectors (see Chapter 2). Following Osterman (1984), who argues that the correct unit of analysis is a subunit such as a department or even a shop (rather than the entire company), we use data at the plant level in engineering and at the store level (either a single store or a group of stores) in retailing. We chose matched-pair companies according to their 4-digit SIC codes (see Chapter 2), thereby ensuring that they produce or sell similar products and are faced with a similar production technology. In the engineering sector, we concentrate on producers of pumps, turbines, and compressors, and in the retailing sector we concentrate on department stores and on stores selling shoes, electronic devices, groceries, and furniture (Table 4-1); in the following sections, we use "company" as a synonym for "plant" and "store".

Table 4-1: Number of companies by sector (SIC 1987)

Sector	Subsector	SIC 1987	GER	CH	U.S.	JPN
Engineering	Pumps and pumping equipment	3561	4	3	4	2
	Turbines and turbine generator sets Air and gas compressors	3511, 3563	2	3	2	3
	All engineering subsectors		6	6	6	5

Sector	Subsector	SIC 1987	GER	CH	U.S.	JPN
Retailing	Department stores	5311	1	3	3	1
	Grocery stores	5411	3	1	1	3
	Shoe stores	5661	2	1	1	1
	Furniture stores	5712	1	1	1	0
	Radio, TV and electronics stores	5731	0	1	1	0
	All retailing subsectors		7	7	7	5

Source: GER and CH, Ryan et al., 2011, Table 1; the U.S. and JPN, own fieldwork.

According to the size definition of the EU (European Commission, 2005), our sample includes 37 large companies with 250 or more employees (all companies in Germany, 9 companies in Switzerland, 5 companies in the U.S., and all companies in Japan) and 12 medium-sized companies between 50 and 249 employees (4 companies in Switzerland, 8 companies in the U.S.). In engineering, all of our data refer to a particular production plant. In

retailing, we contacted both single stores (department stores and large supermarkets with at least 50 employees) and the (regional) headquarters. However, also in the companies where the unit is the entire company, we gathered aggregated information on the stores themselves.

Categorization of companies within countries in the analytical matrix

To test our hypotheses, we first need to fill every quadrant of our analytical matrix by including an example for every possible combination of VET and labor market institutions. Therefore, we investigated companies in four very different countries: Germany, Japan, Switzerland, and the U.S. Instead of using country-level data for measuring labor market institutions and VET as several previous studies have (Paunescu & Schneider, 2004; Hall & Gingerich, 2009; Kogut & Ragin, 2006), we use data from companies[68]. To analyze the specificity and certification of VET programs, we posed the following questions in our investigation:

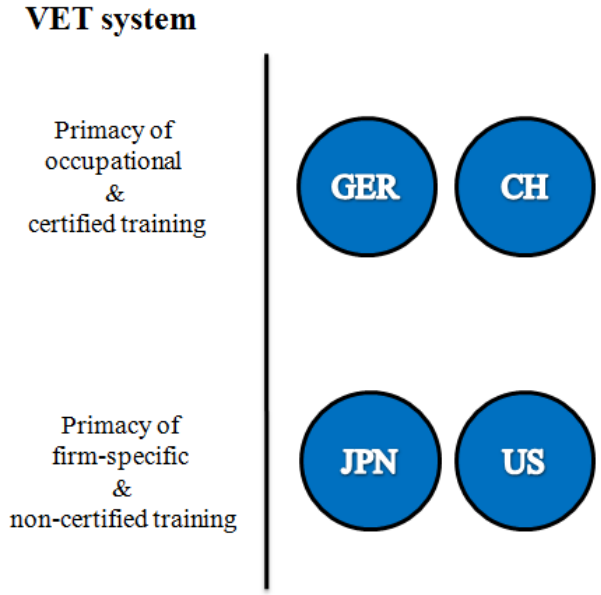
- What are your initial VET programs at the intermediate skill level?
- How long is the initial VET period?
- Are the skills learned during initial VET certified, and are these certificates generally accepted within the sector?

For VET, we identify similarities between companies in two countries, Germany and Switzerland: all of the companies offer broad, occupation-specific VET (apprenticeship training) that lasts 3 to 4 years in engineering, and 2 to 3 years in retailing. This VET design is commonly agreed upon at the occupational level and includes company-internal, school-based, and (partly) inter-company components. The VET content—including the company-internal VET—focuses on broad vocational competencies, reducing the company-specific skills to a comparatively low share (in Germany on average 12%, Pfeifer, Schönfeld & Wenzelmann, 2011). VET in all of our German and Swiss companies ends with an exam and an official certification of the acquired skills for those who meet the standards. Due to the broad and standardized VET and the exams developed at national level, the VET certificate is accepted all over the country and allows skilled persons to switch between companies relatively easily (for further comparison of the training systems, Teuber et al., 2011; OECD, 2009a; OECD, 2010b; Chapter 3).

[68] By using company-level data, we take into account a main point of contention of country-level categorizations, which have been criticized of ignoring within-system diversity (Hancké, Rhodes & Thatcher, 2007).

In contrast, companies in the other two countries, Japan and the U.S., provide mainly company-specific VET that is non-certified. The length of VET varies: Japanese companies usually have a longer training span (see also MacDuffie & Kochan, 1995; Mincer & Higuchi, 1988; Dertouzos, Lester & Solow, 1989; Ito, 1992). In our engineering sample, VET in Japan lasted from four months to four years, with up to 50% of the training taking place off the job in the first year; in the U.S. engineering companies, VET lasted from two weeks to two years, with mostly no off-the-job training (only one company offered it). In retailing, the length of VET was shorter, from 1.5 to 12 months in Japan, with up to 10% being off-the-job training in the first year; and from two days up to one and half months in the U.S., with off-the-job sessions only for security training. The length of VET varies (as in the apprenticeship countries), but the main criteria still hold: VET in both Japan and the U.S. is mainly company-specific, no common training design exists at the national or occupational level, and certification of (vocational) skills rarely takes place (Grugulis, 2008). Only in a few of our Japanese engineering companies new employees had to take a national skill trade test after one year of in-house vocational training. Therefore, in our analytical matrix, we classify companies in Germany and Switzerland as providing occupation-specific and certified VET, and companies in Japan and the U.S. as providing company-specific and non-certified VET (Figure 4-2).

Figure 4-2: Categorization of companies in different countries according to type of VET



Regarding labor market institutions, a general categorization of all of the companies in each country is more difficult than for VET, as companies differ with respect to their company-level labor market institutions. To measure the labor market institutional setting, we use three different measures:

- degree of employment protection, which we measure using the 2008 OECD index of the strictness of employment protection
- whether plant-level employee representation exists
- whether (formal) wage coordination via wage-relevant collective bargaining agreements at the industry/regional level exists.

To measure employment protection, we use the 2008 OECD index of the strictness of employment protection (OECD, 2008) that classifies employment protection in three main areas (employment protection of permanent workers against individual dismissal, specific requirements for collective dismissal, and the regulation of temporary forms of employment). A high index value (at most 6) indicates a high number of restrictions on and costs of dismissal and, therefore, a high level of employment protection. As we are interested in permanent employees, the relevant work group when considering internal promotions, we focus on the employment protection of regular workers against dismissal (see also Chapters 2 and 3). Germany and Japan clearly have a higher level of employment protection (GER: 2.85, JPN: 2.05) than Switzerland (1.19) and the U.S. (0.56).

Regarding our measure of employee representation, we find a mixed picture in our sample. All of the German companies in engineering and retailing had an employee representation (works council); in one German retailing company, however, works councils did not exist in all shops. In Switzerland, all but one engineering company and 3 out of 7 retailing companies had employee representation (personnel commission). No U.S. company had an employee representation (only company unions existed). In Japan, all but one retailing company had an employee representation in form of a works council or consultative body.

The influences of these different forms of employee representations are hard to compare. Relative to the powerful German works councils, Swiss personnel commissions have less influence. German works councils and Swiss personnel commissions are both involved in (or at least informed of) strategic issues within the company and thus increase the cooperation between employer and employees. In Japan, a labor management joint consultation system exists. This consultation body participates in management issues and is

involved in the improvement of production, information sharing, and exchange of opinions. In some cases of Japanese companies, the labor management joint consultation system could also play a substantial role in the negotiation of labor conditions. In general, every collective voice institution should increase the strength of internal labor markets and the share of internal promotion.

Similar to the employee representation variable, the categorization of the companies in the four countries based on the variable "wage coordination" is difficult. The clearest distinction can be drawn between the German and U.S. companies. In Germany, all of the companies in engineering and all but one company in retailing were covered by a collective bargaining agreement negotiated at the industry level between industrial unions and employers' associations[69]. Therefore, formal wage coordination via collective bargaining agreements existed in almost all cases. In the U.S., no company in engineering or in retailing was covered by an industry-wide collective bargaining agreement. Wage agreements at the company level only existed in 4 U.S. engineering companies.

The situations in Japan and Switzerland are more difficult to measure. Even though none of the companies in Japan was covered by an industry-wide collective bargaining agreement, coordination took place. As previous studies have suggested, Germany and Japan have similarly coordinated settings, although Japanese companies coordinate less formally than their German counterparts (Suzuki & Kubo, 2011; Keller & Kirsch, 2011; Thelen & Kume, 1999, 2006; Weathers, 2003). Wage coordination in Japan takes place during the Spring Wage Offensive (Shunto). During Shunto, the wage settlements and wage increases for large companies that are leaders in their industries create a baseline for other companies in the same and other industries[70], and these standards spread also to nonunion industries (Sako & Sato, 1997; Thelen & Kume, 2006; Weathers, 2003). While Japanese unions organize themselves in industrial federations and national centers (a typical example is the Japanese union federation RENGO; JIL, 2000), they have little influence. The same applies to the major employers' association (Nikkeiren).

However, these peak associations and their negotiations, which start months before Shunto, serve as a means to exchange information and coordinate (wage) policies. These coordinated wage increases control competition, which is the prerequisite for lifetime

[69] Our sample is not representative for Germany, as also in Germany institutional change has led to an increasing share of companies, which are not covered by collective bargaining agreements (Streeck, 2009).
[70] The metalworking industry is usually the pattern-setting industry (Sisson, 1987).

employment and seniority wages. (Company) unions in Japan usually aim not for high wages but for employment security for regular workers (Sako & Sato, 1997; Thelen & Kume, 1999). More than 90% of unions in Japan are company-based unions (Hara & Kawaguchi, 2008). Also in our Japanese sample, all of the engineering and all retailing companies had unions at the company level that were affiliated with RENGO via their umbrella organizations. In sum, Japan has a coordinated wage setting structure even though employers' associations and industrial unions are comparatively weak and bargaining agreements (about wage increases, lump-sum benefits, job security, working hours, etc.) are set at the company level (Traxler & Kittel, 2000; Sako & Sato, 1997; Weathers, 2003; Hara & Kawaguchi, 2008).

In Switzerland, we find differences between and within the two sectors studied. None of the engineering companies was covered by formal industry-wide wage coordination, unlike in Germany, and no peak-level negotiations similar to those in Japan existed. Instead, wages in our Swiss engineering sample are solely negotiated at the company level. Although an industry-wide collective bargaining agreement exists in the Swiss engineering sector, the collective bargaining agreement leaves pay to individual agreement between the employer and employee (ASM et al., 2006: Art. 15.2). The two employers' associations, "Swissmem" and "Swissmechanic," conduct wage surveys among their members; however, the results are only for the internal use of the member companies that participated in the survey. In Swiss retailing the situation is different. A few publicly available collective bargaining agreements exist. Some are negotiated at the company level (two companies in our sample had such agreements), and some are negotiated at the cantonal level. Although none of our companies was covered by collective bargaining agreements at the cantonal level, these agreements might influence their wage setting and coordinate wages within the sector. Whether more informal wage negotiations take place in Switzerland is still open to discussion (Ryan et al., 2010b). However, Swiss retailing seems more coordinated than Swiss engineering, and our Swiss retailing companies act in a labor market institutional setting that tends toward the coordinated German situation.

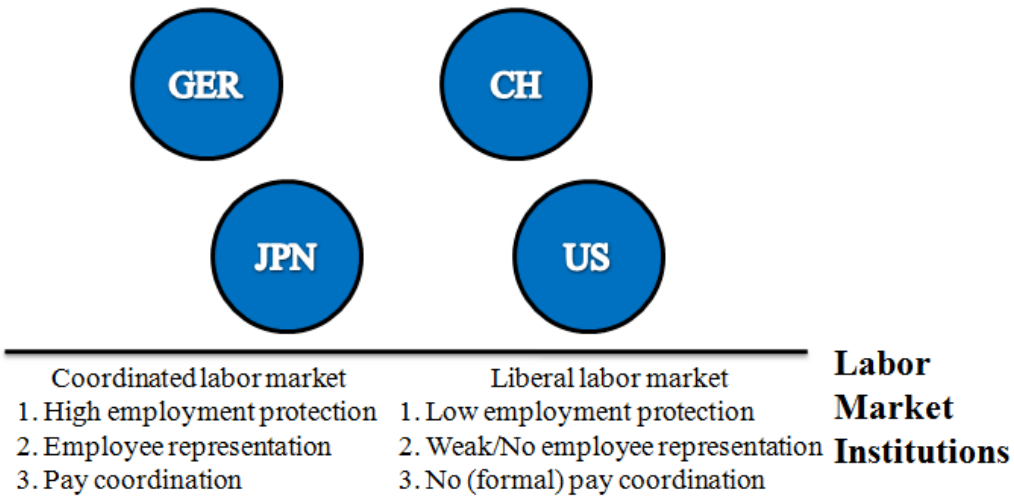
Due to the difficulties of making selective categorizations based on labor market institutions, some companies stand in the middle between the coordinated and liberal sides, as labor market institutions differ only by a matter of degree (Figure 4-3). Our first measure, the OECD index of the strictness of employment protection, allows for the clearest categorization that is valid for all companies in one country. German and Japanese companies lie close

together in terms of their high employment protections for permanent employees, while U.S. and Swiss companies constitute the opposite pair.

Regarding employee representation, German works councils have the strongest influence; Japanese unions do not have the same legally ensured rights but still seem to have significant influence on working conditions, especially during wage negotiations. Swiss personnel commissions have legally ensured rights but definitely have less influence than German works councils. In the U.S. companies no employee representation bodies existed. In our analytical matrix, we again categorize German companies and U.S. companies as the polar cases. Japanese companies and Swiss companies with employee representation are in between and more coordinated, Japanese and Swiss companies without employee representation are in between and more liberal.

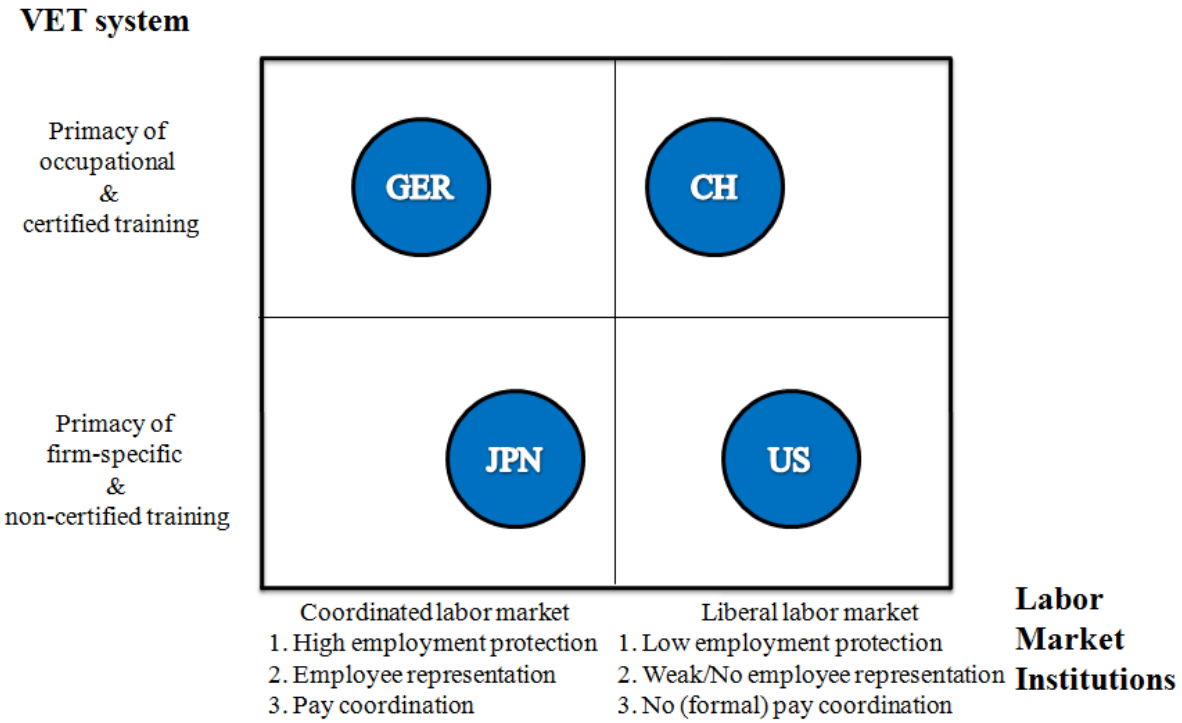
Finally, regarding wage coordination, we again consider the German companies (all but one retailing company were covered by industry-wide collective bargaining agreements) to be coordinated examples and the U.S. companies (no industry-wide wage coordination) to be liberal examples. Japanese companies seem to tend more toward the German cases due to the strong informal wage coordination. Swiss engineering companies resemble more closely the companies in the U.S., while Swiss retailing cases tend to have more wage coordination.

Figure 4-3: Categorization of companies in countries according to labor market institutions



Finally, we can fill every quadrant of our analytical matrix (Figure 4-4) with our sample of companies in the four countries and operationalize our theoretical model.

Figure 4-4: Analytical matrix and company categorization



After clarifying the independent variables, we now describe our dependent variables. Doeringer and Piore (1985) posit that vertical mobility, which we measure by the percentage of internal promotion to the supervisory level, is one of the main dimensions of internal labor markets. From a theoretical point of view, this percentage allows us to measure the degree to which the external and the internal labor markets are interconnected, to what extent jobs at the first rung of the managerial ladder are ports of entry into the internal labor market, and to what extent employees have the opportunity for further development within the company. Moreover, by also including data on average mobility, we find explanations for the average tenure figures measured in previous studies, for example, whether at least a core workforce advances internally, while the rest of the workforce shows higher mobility, or whether all employees have high average tenure, but the supervisors are nevertheless recruited externally. Such details make an important difference in the logic of the internal labor market. Finally, we also include figures on the contract offer behavior of companies after training to measure how interested companies are in retaining employees. Our questions measuring internal promotion are as follows:

- How do you typically fill your vacancies for production supervisors?
  (for engineering companies)

- How do you typically fill your vacancies for department/store managers?
  (for retailing companies)

Answer: X% of vacancies at the supervisory level are usually filled by internal promotion,
(1-X)% of vacancies at the supervisory level are usually filled by external recruitment

The questions measuring labor turnover are as follows:

- What is your rate of labor turnover as a percentage (annual, in 2007; excluding retirements)?
- What percentage of those who complete your VET program is offered an employment contract?

The following section analyzes our hypotheses using pairwise comparisons of our matched-pair companies in different countries, keeping either VET or the institutional variables constant.

4.4 Results

4.4.1 Association of the type of VET with promotion patterns

We first analyze the influence of the type of VET on promotion patterns in the matched-pair companies. Therefore, we compare the company pairs that are largely similar in their institutional settings to keep that variable constant. We first compare German and Japanese companies that act in coordinated labor market institutions but differ in the types of VET they provide (Table 4-2).

Table 4-2: Association of the type of VET provided in coordinated labor market institutions with promotion patterns (figures in percentages)

Sector	**engineering**			**retailing**		
Country	**GER**	**JPN**	**Δ (expected Δ)**	**GER**	**JPN**	**Δ (expected Δ)**
Internal promotion to supervisors	78.3	98.6	-20.3 (expected **Δ<0)**	61.4	96.4	-35.0 (expected **Δ<0)**
Labor turnover all employees	1.7	1.2	0.5 (expected **Δ>0)**	10.1	18.9	-8.8 (expected **Δ>0)**
Contract offer after training	98.8	100	-1.2 (expected **Δ<0)**	80.3	100	-19.7 (expected **Δ<0)**

Note: only 5 out of 6 German engineering companies could provide information on labor turnover

The comparison between companies acting in coordinated labor market institutions (Germany and Japan) suggests that the type of VET is associated with the promotion patterns in both engineering and retailing companies. In engineering, the internal promotion share in Japanese companies is 20 percentage points higher than in their German counterparts; in retailing, the difference is even larger (35 percentage points). Therefore, we find, as expected in hypothesis H1a, a higher percentage of internal promotions in the Japanese companies that offer company-specific, non-certified VET than in their German counterparts that provide occupation-specific, certified VET (Table 4-2).

The measure labor turnover used by previous literature, such as the VoC, to identify the strength of internal labor markets does not fully reflect the large differences in internal promotions. In engineering, the mobility figures and contract offers after training are almost identical. In retailing, the mobility figures for all employees even suggest a weaker internal labor market in Japan. These figures contradict the notion of a stronger internal promotion strategy in Japanese companies[71]. Therefore, the separate analysis of our measure "internal promotion" and the labor turnover measures used in previous studies is essential.

We now compare U.S. and Swiss companies that act in similarly liberal labor market institutions but differ in the type of VET they provide (Table 4-3).

[71] The high percentage of promotions in Japanese companies combined with a level of mobility similar to or higher than that in German companies, points to a strong reliance on core workers in Japan (see also Thelen & Kume, 1999, 2006).

Table 4-3: Association of the type of VET provided in liberal labor market institutions with promotion patterns (figures in percentages)

Sector	**engineering**			**retailing**		
Country	**CH**	**U.S.**	**Δ (expected Δ)**	**CH**	**U.S.**	**Δ (expected Δ)**
Internal promotion to supervisors	40.8	64.8	-24.0 (expected **Δ<0)**	59.8	60.7	-0.9 (expected **Δ<0)**
Labor turnover all employees	5.8	2.8	3.0 (expected **Δ>0)**	17.2	24.1	-6.9 (expected **Δ>0)**
Contract offer after training	56.6	100	-43.4 (expected **Δ<0)**	64.0	100	-36.0 (expected **Δ<0)**

Note: only 5 out of 6 U.S. engineering companies and 6 out of 7 U.S. retailing companies could provide information on labor turnover, only 5 out of 6 Swiss engineering companies could provide information on contract offer after training

Also the comparison between companies in liberal market institutions (the U.S. and Switzerland) suggests that the type of VET is associated with promotion patterns in both engineering and retailing, yet the association seems weaker in retailing. In engineering, the internal promotion share in U.S. companies is more than 20 percentage points higher than in their Swiss counterparts; in retailing, the difference is only 1 percentage point, which might be due to the previously described fact that the labor market institutions in Swiss retailing are less liberal than in Swiss engineering. Although the difference in promotion patterns is small in retailing, the sign of the difference does not refute hypothesis H1b, in that we find a higher percentage of internal promotions in U.S. companies that offer company-specific, non-certified VET than in their Swiss counterparts that provide occupation-specific and certified VET (Table 4-3).

In engineering, also the labor turnover and contract offer measures reflect the difference in the strength of the internal labor market. In retailing, however, the differences in labor turnover suggest weaker internal labor markets in the U.S., while the contract offer figure suggests a much stronger internal labor market than is indicated by the internal promotion figures. Therefore, again, the separate analysis of our "internal promotion" measure and the mobility measures used in previous studies is essential.

In sum, we find an association of the type of VET with internal promotion patterns in both coordinated and liberal labor market institutions for engineering and retailing. Companies that provide company-specific and non-certified VET show a higher percentage of

internal promotion than their counterparts with occupation-specific and certified VET. Therefore, we cannot refute the hypothesis that the type of VET is an independent factor that influences the strength of internal labor markets.

4.4.2 Association of the type of labor market institutions with promotion patterns

We now analyze the influence of the type of labor market institutions on promotion patterns. Therefore, we compare companies with similar types of VET to keep that variable constant. We first compare companies with occupation-specific and certified VET (Table 4-4).

Table 4-4: Association of coordinated labor market institutions with promotion patterns in companies with occupation-specific and certified VET (figures in percentages)

Sector	**engineering**			**retailing**		
Country	**CH**	**GER**	**Δ (expected Δ)**	**CH**	**GER**	**Δ (expected Δ)**
Internal promotion to supervisors	40.8	78.3	-37.5 (expected **Δ<0)**	59.8	61.4	-1.6 (expected **Δ<0)**
Labor turnover all employees	5.8	1.7	4.1 (expected **Δ>0)**	17.2	10.1	7.1 (expected **Δ>0)**
Contract offer after training	56.6	98.8	-42.2 (expected **Δ<0)**	64.0	80.3	-16.3 (expected **Δ<0)**

Note: only 5 out of 6 German engineering companies could provide information on labor turnover, only 5 out of 6 Swiss engineering companies could provide information on contract offer after training

The comparison between companies with occupation-specific and certified VET (Swiss and German companies) suggests that the type of labor market institution is associated with promotion patterns in both engineering and retailing, even though the association is weaker in retailing. In engineering, the internal promotion share in German companies is more than 35 percentage points higher than that in their Swiss counterparts. In retailing, the difference between the promotion patterns is small (less than 2 percentage points), which again might be because the labor market institutions in Swiss retailing are less liberal than in Swiss engineering. While promotion patters differ little in retailing, the difference has the expected sign and thus does not refute hypothesis H2a, in that we find a higher percentage of internal promotions in German companies that act in more coordinated labor market institutions than in their Swiss counterparts that act in more liberal labor market institutions (Table 4-4).

While in engineering companies, the labor turnover and contract offer measures reflect a difference in the strength of internal labor markets, the turnover and contract offer figures in retailing companies suggest stronger differences in the internal labor market than was found with the internal promotion figures.

Taking a closer look at the companies' labor market institutions, we can also find associations between labor market institutions and promotion patterns within a country. We find a difference in the expected direction between the five Swiss engineering companies with employee representation that have an internal promotion share of 49% and the company without employee representation with an internal promotion share of 0%. Between companies with employee representation and companies without employee representation, the labor turnover (6.5% to 2%) and contract offer figures (58.2% to 50%) differ only slightly. As the German engineering companies show no differences in their labor market institutions (all were covered by an industry-wide collective bargaining agreement and had employee representation within the company), a further analysis is not possible.

In retailing, we identify two German companies that, in contrast to the other German retailers in our sample, exhibit more liberal labor market institutions, in the sense that they are either not part of the collective bargaining agreement or only have employee representation (works councils) in some of the shops. These companies have the lowest percentage of internal promotion (11% compared to 82% in other German companies) consistent with our expectation that coordinated labor market institutions such as works councils are positively associated with internal labor markets. The retailing companies also show higher labor turnover (15% compared to 8%); contract offers differ in a surprising direction (91% compared to 76%).

In sum, our findings suggest that coordinated labor market institutions are positively associated with internal promotions when VET is occupation-specific and certified. We now analyze whether that association also exists in companies that provide company-specific, non-certified VET (Table 4-5).

Table 4-5: Association of the type of liberal labor market institutions with promotion patterns in companies with company-specific and non-certified VET (figures in percentages)

Sector	**engineering**			**retailing**		
Country	**U.S.**	**JPN**	**Δ (expected Δ)**	**U.S.**	**JPN**	**Δ (expected Δ)**
Internal promotion to supervisors	64.8	98.6	-33.8 (expected **Δ<0)**	60.7	96.4	-35.7 (expected **Δ<0)**
Labor turnover all employees	2.8	1.2	1.6 (expected **Δ>0)**	24.1	18.9	5.2 (expected **Δ>0)**
Contract offer after training	100	100	0 (expected **Δ<0)**	100	100	0 (expected **Δ<0)**

Note: only 5 out of 6 U.S. engineering companies and 6 out of 7 U.S. retailing companies could provide information on labor turnover

Also the comparison between companies with company-specific, non-certified VET (Japanese and the U.S. companies) suggests that the type of labor market institutions is associated with promotion patterns in both engineering and retailing. In engineering, the internal promotion share in Japanese companies is more than 30 percentage points higher than in their U.S. counterparts; in retailing, the internal promotion share in Japanese companies is more than 35 percentage points higher. Therefore, we find, as expected in hypothesis H2b, a higher percentage of internal promotions in Japanese companies that operate in coordinated labor market institutions than in their U.S. counterparts that operate in more liberal labor market institutions (Table 4-5).

The labor turnover measure reflects differences in the strength of internal labor markets in both engineering and retailing; however, the differences found using internal promotion figures are larger than suggested by labor turnover. The contract offer figures do not differ, as trainees in both countries automatically become employees of the companies after a particular probation period.

Taking a closer look, we again find associations between labor market institutions and promotion patterns also within a country. In our sample, we have four U.S. engineering companies with plant-level unions and collective bargaining agreements and two U.S. engineering companies without these features. Plant-level unions usually act as coordinated labor market institutions that foster internal labor markets, as a vacancy can only be filled by external recruitment when no employee wants to bid for it or no employee is qualified enough. This was also the case in our unionized companies. Surprisingly, the unionized U.S.

companies show a lower share of internal promotion (47.3%) than their non-unionized U.S. counterparts, which have an internal promotion share of 100% (labor turnover of unionized companies was 3% compared to 2.5%, contract offer figures did not differ).

During our interviews, we found a possible reason for the surprisingly low internal promotion share in unionized U.S. companies. As supervisors are not covered by the plant-level collective bargaining agreement, companies have problems finding internal candidates to "bid for" the supervisory jobs because employees are reluctant to lose their increased employment protection, which is a part of the bargaining agreement. Statements by the personnel managers in the unionized engineering companies verify this problematic interaction:

> *"It is difficult to find internal personnel interested in the supervisor position, as they don't want to leave their union agreement and employment protection."* (US-company A)

> *"Not many employees are interested in bidding for these positions. This is why the company fills these positions with external employees, even though the internal employees would be the better supervisors. Only one ever bid because employees don't want to leave collective bargaining and don't want to give orders to their colleagues."* (US-company B)

The two non-unionized U.S. engineering companies succeed in completely filling supervisory vacancies internally.

In sum, we find an association of the type of labor market institutions and internal promotion patterns in both companies that provide occupation-specific, certified and company-specific, non-certified VET, in both engineering and retailing. Companies that operate in more coordinated labor market institutions show a higher percentage of internal promotion than their counterparts operating in more liberal labor market institutions. Therefore, we cannot refute the hypothesis that the type of labor market institutions is an independent factor that influences the strength of internal labor markets. Furthermore, within-country variations in promotion figures can partly be explained by differences in labor market institutions. The influence of plant-level unions and collective bargaining agreements in the

U.S. highlights the necessity of taking a closer look at institutional details—as Baker and Holmstrom (1995) have already suggested.

In sum, the comparison of matched-pair engineering and retailing companies in Germany, Japan, Switzerland, and the U.S shows that the type of VET and the type of labor market institutions have separate effects on internal labor markets as measured by the percentage of internal promotions to the supervisory level (see overview in Table 4-6). The results also suggest that the two dimensions can strengthen each other in their effect on the promotion behavior of companies. The highest percentage of internal promotions can be found when company-specific, non-certified VET and coordinated labor markets are combined (as it is the case in Japan), the lowest percentage of internal promotions can be found when occupation-specific, certified and liberal labor markets are combined (as it is the case in Switzerland).

Table 4-6: Overview of results

VET system	Coordinated labor market	Liberal labor market
Primacy of occupational & certified training	**Germany** Internal promotion to supervisor (in %) Engineering: 78.3 Retailing: 61.4	**Switzerland** Internal promotion to supervisor (in %) Engineering: 40.8 Retailing: 59.8
Primacy of firm-specific & non-certified training	**Japan** Internal promotion to supervisor (in %) Engineering: 98.6 Retailing: 96.4	**United States** Internal promotion to supervisor (in %) Engineering: 64.8 Retailing: 60.7
		Labor Market Institutions

4.5 Discussion and conclusion

Based on the existing institutional and economic literatures and given the empirical fact that different combinations of VET systems and labor market institutions exist, we argue that separate analyses of the two dimensions are necessary. The comparison of matched-pair engineering and retailing companies in Germany, Japan, Switzerland, and the U.S. shows that

the type of VET and the type of labor market institutions have separate effects on internal labor markets as measured by the percentage of internal promotions to the supervisory level. While companies that provide company-specific and non-certified VET show a higher percentage of internal promotion than their counterparts with occupation-specific and certified VET, companies that operate in more coordinated labor market institutions show a higher percentage of internal promotion than their counterparts operating in more liberal labor market institutions.

Given these results, Japanese companies combine company-specific and non-certified VET with a coordinated institutional setting, both of which support internal labor markets. Swiss companies (at least in engineering) combine occupation-specific and certified VET with a liberal institutional setting, both of which support inter-firm mobility instead of internal labor markets. Therefore, companies in both Japan and Switzerland constitute "complementary" cases in the sense that in these companies both dimensions—VET and labor market institutions—reinforce each other's effects on internal labor markets. In contrast, German and U.S. companies constitute "mixed cases," where VET and labor market institutions weaken each other's effects on internal promotions. At least with regard to internal promotion patterns, these results contrast with the previous literature that stresses the strong complementarities between VET and labor market institutions in Germany and the U.S. (Hall & Soskice, 2001).

Our theoretical and empirical results contribute to the debate on the strength of internal labor markets in an occupation-specific VET system. Our results support Marsden's (1986, 1990) argument that occupation-specific, certified VET is associated with weaker internal and stronger occupational labor markets and Soskice's argument (1994) that strong internal labor markets are also possible in countries with a transferable (occupation-specific) type of VET. Using our analytical matrix, we argue that labor market institutions have to be analyzed as a separate dimension. Coordinated labor market institutions weaken the mobility-enhancing effect of transferable VET. Therefore, we find a higher internal promotion share in German companies than in their Swiss counterparts. Intra-national heterogeneity also shows the association between labor market institutions and promotion patterns. Taking labor market institutions into account as an additional and separate dimension, the contradiction between Marsden's and Soskice's arguments is resolved.

Furthermore, our results support Baker and Holmstrom's (1995) call for an in-depth institutional analysis. Among other things, we found that particular labor market institutions

such as plant-based unions and plant-based collective bargaining agreements, which are usually thought to strengthen internal labor markets, can have the opposite effect when employees are promoted to positions that are no longer covered by these agreements. Our results show that "administrative work rules" (Doeringer & Piore, 1985:5) can reduce the efficiency of internal labor markets in the sense that the best solution both for the company (having qualified and experienced supervisors) and for the employees (obtaining more responsibility and pay at a higher position) does not take place, thus stressing the importance of taking these rules into account and further inquiring the origins and persistence of these rules (Osterman, 2011).

Our analysis has several limitations. First and foremost, our data set is small, not necessarily representative of a certain country, and most notably, it does not allow for a multivariate analysis. Due to the lack of control variables, we cannot rule out other influences being responsible for our results. Further internationally comparative studies should attempt to overcome this limitation by gathering more data, thus allowing for multivariate regression analyses. Furthermore, size effects may bias our results. We have, for example, more medium-sized engineering companies in Switzerland than in Germany, which could explain the weaker internal labor markets. We cannot exclude that possibility. However, that large companies in Switzerland exist that have comparatively low internal promotion figures makes us confident that our results point in the right direction. If size, and not labor market institutions, was the decisive factor, we would not find this result.

Second, one could also argue that we neglect several other possibly important explanations for internal promotions, such as the tournament theory (which analyzes incentives for effort), or job assignment and allocation of tasks (internal promotions are the natural consequence of the acquisition of skills that are more productive at jobs with higher responsibility). However, as Gibbons and Waldman (1999b: 1322) put it, "The job assignment literature does not provide direct explanations for wage and promotion dynamics"—and the aim of this paper has been to fill that gap. Similarly, tournament theory explains why internal promotions take place; however, why the extent of the incentives provided by internal promotions varies among countries cannot be fully explained with this approach.

After investigating the interplay of VET and labor market institutions on internal labor markets at two hierarchical levels, namely the skilled worker and supervisory level, we

analyze in the following chapter how companies adapt their organizations to national-level differences in VET systems and labor market institutions.

CHAPTER 5

How do companies adapt their organization to national institutions: evidence from matched-pair engineering companies?

5.1 Introduction

Several studies in industrial relations and political economy literatures argue that a country's national institutional setting creates competitive advantages for particular industries (Hall & Soskice, 2001; Porter, 1990; Lundvall, 1992; Whitley, 2007). One of the most prominent approaches that analyzes institutional similarities and differences across economies, is the "Varieties of Capitalism" (VoC) approach of Peter Hall and David Soskice (2001)[72]. According to the VoC approach, the national institutional setting of coherently coordinated market economies (CMEs) such as Germany offers significant advantages for quality-oriented engineering production companies; in contrast, the national institutional setting of coherently liberal market economies (LMEs) such as the U.S. favors service-oriented or research-dominated companies (e.g., Schneider, Schulze-Bentrop & Paunescu, 2010; Haake, 2002; Hall & Soskice, 2001; Nooteboom, 2000; Soskice, 1997). Therefore, companies in different countries concentrate on different sub-sectors and products for which the particular national institutional setting is advantageous (e.g., in the biotechnology sector, companies focus on the development of pharmaceuticals in the U.S. and on the invention and production of (research) machinery, and platform enabling technologies in Germany; Hall & Soskice, 2001; Casper, Lehrer & Soskice, 1999; Casper & Whitley, 2004; Akkermans, Castaldi & Los, 2009).

However, companies are not perfectly sorted according to the national institutional setting. We find large, research-intensive pharmaceutical companies in Germany (e.g., Bayer) and manufacturing companies producing turbines and machinery in the U.S. (e.g., General Electric). Given the differing competitive advantages that stem from institutional settings, the question arises as to how *matched-pair* companies that produce highly similar products and

[72] The foci of other approaches include, for example, trade union behavior and strategy (e.g., Hyman, 2001), the power of organized labor, the centralization of labor and capital (e.g., Crouch, 1993), and welfare-state attributes (e.g., Esping-Andersen, 1990; Hicks & Kenworthy, 2003).

compete in the same (global) markets adapt organizationally to *different and possibly less favorable* national institutional settings.

Previous comparative literature has focused on the behavior of matched-pair companies in different countries. Backes-Gellner (1996) finds, in her sample of matched-pair companies in the service and industry sectors in the UK, Luxembourg, France, and Germany, that companies adapt their training strategies to the institutional setting but end up with broadly the same stock of qualifications, which allows them to produce similar products. Focusing on organizational issues, Maurice, Sellier, and Silvestre (1986) argue that technology does not fully determine a company's organizational structure (measured by the span of control) but that national training and educational systems play an important role because they influence the qualification level of the workforce. The higher the qualification level of the workforce is ("professionalization"), the less supervisory input will be required (Maurice, Sorge & Warner, 1980; Maurice, Sellier & Silvestre, 1986). Consistent with Maurice, Sorge and Warner's results, Mason (2000) shows that German supervisors have a broader span of responsibility than their counterparts in the UK and the U.S (see also Finegold & Wagner, 1998).

Previous literature thus suggests that the span of control (number of employees per supervisor) is an important mechanism of adaptation to the national institutional setting. However, the literature does not take into account whether the companies are operating in a more or less favorable and a more or less coherent national institutional setting. Given that the span of control is an important mechanism of organizational adaptation, the questions arise whether the span of control differs systematically depending on the institutional setting and with what kind of institutional configurations the span of control is associated. We examine these questions by theoretically analyzing how companies complement (available or non-available) national institutions by company-level institutions and how they adapt by their span of control. We derive hypotheses about potential configurations of national- and company-level institutions, which we then test with production plant data gathered through interviews in matched-pair engineering companies in Germany, Switzerland, the UK, and the U.S. (see Chapter 2). We choose this set of countries to include the VoC examples of coherent liberal and coordinated market economies (the U.S. and Germany) and two less coherent countries that combine liberal and coordinated features to different extents (the UK and Switzerland).

To reveal in detail which configuration of institutional variables is linked to what kind of span of control, we apply the qualitative comparative analysis (QCA, Ragin, 1987) because this method has already proven useful for testing VoC propositions (e.g., Kogut & Ragin,

2006; Boyer, 2004; Schneider, Schulze-Bentrop & Paunescu, 2010). This method is also particularly useful for conducting cross-country comparisons (e.g., Ebbinghaus & Visser, 1999), examining strategic management questions (e.g., Greckhamer et al., 2008), and has been designed for formally analyzing qualitative evidence and small data sets.

Our results show that, depending on the national institutional setting, matched-pair engineering companies differ substantially in their span of control of their production supervisors. Production supervisors in companies producing in the highly coordinated and coherent market economy of Germany have on average, a broader span of control than those in the highly liberal and coherent market economy of the U.S. Furthermore, German companies all have a broad span of control, and U.S. companies form a consistent cluster in which all have a narrow span of control. It is only in the two less coherent countries, Switzerland and the UK that we can find companies with a broad and companies with a narrow span of control. Based on these results, we further identify the institutional configurations at the company level and the related spans of control.

This paper contributes to the existing literature in three ways. First, we provide answers to the question of how companies adapt to different national institutional settings with various degrees of industry-specific favorability and coherence. To define whether institutional settings are more or less coherent, we use the VoC approach and thus take into account Redding's call for a "thick description" (Redding, 2005: 123) of institutions by providing a broad institutional view with a simultaneous analysis of several institutional variables (Jackson & Deeg, 2008). Second, we show the institutional diversity that is hidden beneath the macro-institutional evidence (Schneider, Schulze-Bentrop & Paunescu, 2010). To explore this institutional diversity, we analyze institutional configurations at two levels, namely the national and the company level. Third, we show how companies react with their company-level institutional setting and their span of control to the national institutional setting and are able to link institutional variables directly to the outcomes—in contrast to previous national-level analyses which have therefore been criticized (Allen, 2004).

The paper proceeds as follows. In Section 2, we use and extend the VoC approach to derive two hypotheses on national-level differences and two hypotheses on company-level differences. Section 3 describes the data. The first part of section 4 provides the results of our national-level hypotheses. The second part of section 4 provides the company-level results using QCA-analysis. Section 5 concludes with a further evaluation of our evidence, relating it

back to the VoC approach and developing implications of the findings for both theory and company policy.

5.2 Theory and hypotheses

Our theoretical analysis of organizational adaptation and institutional configuration is based on the Varieties of Capitalism (VoC) approach. This approach was developed by Hall and Soskice (2001) and is considered to be the "state of the art of institutional analysis" (Howell, 2003: 121). The VoC approach categorizes economies according to their institutional configurations. The two polar forms of economies are the coordinated and the liberal market economy, with the U.S. and Germany as the most coherent examples.

Companies in coordinated market economies (CMEs, such as Germany) are embedded in a network of mediating institutions. CMEs are characterized by cooperative industrial relations systems within companies, strong collective bargaining across companies, strict employment protection, nationally coordinated vocational education and training (VET) systems, a high investment in vocational (rather than university) training, and financial systems that allow for long-term investment horizons for companies (Hall & Soskice, 2001: 21ff).

Companies in liberal market economies (LMEs, such as the U.S.) lack mediating collective institutions and rely instead on institutions such as markets and hierarchies. LME configurations are the reverse of the CME model: little cooperation within companies but strong management power, no (or, at most, company-based) collective bargaining, weak employment protection, high (individual) investment in university training, and a high stock market capitalization (Hall & Soskice, 2001: 27ff).

The different institutional settings generate different, industry-specific advantages, depending on whether the country is an LME or a CME. Companies in LMEs have competitive advantages in industries that rely on radical product innovations such as biotechnology and telecommunications as companies can dismiss labor and close plants quickly, and easily shift capital from one industry to another, which both allows them to invest in risky but potentially lucrative R&D projects in high-tech industries. The high percentage of university graduates provides a suitable workforce for these types of industries (Hall & Soskice, 2001: 40ff).

In contrast, CMEs provide advantages for industries that are based on incremental innovation such as the improvement of production processes. These advantages stem from

their vocationally highly qualified employees—resulting from the VET system. High employment protection gives employees the incentives to invest in company-specific knowledge and leads to strong internal labor markets and highly skilled supervisors. As a result of the company-internal corporatism, workers are involved in planning, in troubleshooting, and in introducing the latest technologies in ways that enhance product quality and improve production processes. Therefore, industries such as mechanical engineering find a suitable and favorable environment for their production in CMEs (Hall & Soskice, 2001: 39ff).

According to the VoC approach, institutional complementarities are important for improving the functional capability of the institutional setting and, therefore, also for generating industry-specific comparative advantages (Hall & Soskice, 2001: 17ff). Complementarity in this context means that the "functioning of one depends on and enhances the functioning of others" (Campbell & Pedersen, 2007: 311). Complementarity increases with institutional coherence, meaning that all institutions have the same shape (e.g., coordinated) and thus fit to each other. The importance of complementary institutions has been supported by several studies (e.g., Schneider, Schulze-Bentrop & Paunescu, 2010; Hall & Gingerich, 2009[73]).

We expect that these institutional complementarities can exist both at the national and the company level and that particular institutional configurations are associated with either a broad or a narrow span of control. Using company-level functionally equivalent institutions, companies can complement or substitute functions that are provided (or not provided) by national-level institutions. We investigate institutional configurations at the national level, as suggested by the VoC approach, and at the company level to expand the national-level literature. Using the VoC approach, the following section analyzes which institutional configurations at the national level are theoretically associated with a broad and with a narrow span of control.

Institutions at the national level

A coherent configuration of coordinated national institutional variables, namely a VET system, coordinated wage setting, high employment protection, and employee representation

[73] Evidence that extreme cases (degree of centralization of national bargaining systems) perform better than intermediate ones was previously provided by Calmfors and Driffill (1988). For the effects of labor market institutions on unemployment and growth, see e.g., Nickell and Layard (1999).

should be associated with a broad span of control. Each institutional variable fulfills a particular function described in the following paragraphs.

First, the better the VET system and thus the more skilled the employees in production are, the fewer supervisors are necessary for supporting and monitoring them. Osterman (1994) found in his U.S. study of the supervision intensity of blue-collar core workers that the skill level of the employees is inversely associated with the amount of supervision they receive (see also Maurice, Sellier & Silvestre, 1986). Moreover, better-qualified employees need less monitoring also because they can perform more demanding and interesting jobs and are thus more motivated. Therefore, we argue that a VET system lays the skill foundation for a broad span of control.

Second, coordinated wage setting at the industry (or higher) level—showing a high level of employer coordination and a high degree of corporatism—supports long tenure and strong internal labor markets[74]. Similarly, high employment protection decreases employees' incentive to change employers and increases their incentive to invest in company-specific knowledge (Estevez-Abe, Iversen & Soskice, 2001; Wasmer, 2006). Long tenure and strong internal labor markets ensure a set of employees with company-specific knowledge, i.e., an excellent pool of (potential) supervisors who know the company inside out and can take high responsibility. Therefore, we argue that both coordinated wage setting and high employment protections lay the skill foundation *within* the company for a broad span of control by ensuring that the highly qualified employees remain in the company at different hierarchical levels (production workers and supervisors).

Finally, the existence of and a company's cooperation with an employee representation should increase trust between the management and employees (for literature on works councils, see e.g., Frege, 2002). According to Hall and Soskice (2001: 24f), works councils provide "employees with security against arbitrary lay-offs or changes to their working conditions." This security increases trust between the management and production workers and contributes to a more cooperative environment. Since a broad span of control requires trust between workers and their supervisors to ensure that workers use their discretion in the interest of the company, we argue that an employment representation is another foundation for a broad span of control.

[74] The positive relationship between coordinated wages and internal labor markets occurs because employer coordination reduces the danger that skilled labor will be poached (Culpepper, 2001) and reduces employees' incentives for leaving the company as wages are equalized at "equivalent skill levels across an industry," assuring workers "that they are receiving the highest feasible rates of pay in return for the deep commitments they are making to firms" (Hall and Soskice, 2001: 25).

As a VET system, coordinated wages, high employment protection, and works councils all apply to coherent CMEs and none of them apply to coherent LMEs, we expect a broad span of control in coherent CMEs and a comparatively narrow span of control in coherent LMEs, in which all of the foundations for a broad span of control are missing.
Therefore, we derive hypothesis 1 as follows:

H1: Companies in coherent LMEs show a narrower span of control than those in coherent CMEs.

Following the VoC approach, we identify coherent CMEs with Germany, and coherent LMEs with the U.S.

As already argued, the VoC approach emphasizes complementary relationships between various institutional variables. In less coherent countries, which are neither fully coherent LMEs nor fully coherent CMEs, complementarities are not fully guaranteed. Thus, companies may react in different ways because neither a broad nor a narrow span of control is clearly favorable. Therefore, we expect to find a larger range in the spans of control of companies in less coherent countries than of companies in more coherent countries.
Therefore, we derive our hypothesis 2 as follows:

H2: Companies in less coherent market economies show a larger range in the span of control than companies in more coherent market economies (which show a small range of narrow or a small range of broad spans of control).

In our empirical analysis, we use Switzerland and the UK as examples for less coherent economies, as explained in section 5.4.1.1.

Company-level measurement of institutions

Although a country's institutional setting provides an important framework, the company might still have some managerial freedom regarding how to act within that framework and how to design the institutional setting at the company level. One example would be that a company might choose to have strong internal labor markets even though the degree of a country's employment protection is low. In particular, when the institutional setting at the

country level is less coherent, we expect to find functionally equivalent institutions at the company level to ensure a coherent set of complementary institutions. Since companies in less coherent countries can choose to complement either the coordinated or the liberal institutional variables in a complementary way, we expect to find a broader variation of institutional configurations in the less coherent countries than in the more coherent countries.
Thus we derive a third hypothesis, as follows:

> *H3: Companies in less coherent market economies show more configurations of company-level institutional variables than companies in more coherent market economies.*

Furthermore, we argue that coherent institutional configurations lay the foundation for either a broad or a narrow span of control. Therefore, we expect to find companies with a broad span of control if they have coherent institutional configurations of the coordinated type and we expect to find companies with a narrow span of control if they have coherent institutional configurations of the liberal type.
Thus, we derive a fourth and a fifth hypothesis:

> *H4: Companies with a coherently coordinated company-level institutional configuration (coordinated in all institutional variables) show a broad span of control.*
> *H5: Companies with a coherently liberal company-level institutional configuration (liberal in all institutional variables) show a narrow span of control.*

To provide empirical evidence on our five hypotheses, we use a unique set of data described in the following section.

5.3 Data set

To test our hypotheses, plant-level data is required because the span of control and the institutional configuration has to be measured at the relevant unit for the production area[75].

[75] In the following, we use the terms "plant" and "company" synonymously.

Since we need detailed company data, the sample size is small by necessity. Therefore, we decided to use a matched-pair approach to reduce heterogeneity. To do so, we collected plant-level data for engineering companies; the data was gathered in Germany, Switzerland, the UK, and the U.S. through face-to-face interviews with personnel managers, and was supplemented with secondary data analysis and expert interviews. The interviews, which took place between April 2008 and October 2009, were combined with on-site visits to the production facilities. We identified the cases by matching companies ("matched-pairs") according to their 4-digit SIC codes, which reflect the product line and production technology.

Overall, 22 comparable engineering plants provided the necessary information. We chose the pumps and the turbines subsectors as the primary SICs. The limited number of engineering companies available and willing to participate in the study (particularly in the UK) led to the inclusion of additional subsectors: compressors and aero engines which resemble in their skill requirements to a great extent the pump and turbine companies. Compressors have an SIC code near to that of pumps, and the UK aircraft engine company also produces air gas turbines, which are similar to the other turbines in our sample. For an overview of the country and sector distribution, see Table 5-1.

Table 5-1: Number of participating companies by sector (SIC 1987)

Sector	Subsector	SIC 1987	GER	CH	UK	U.S.
Engineering	Pumps and pumping equipment	3561	4	3	3	3
	Turbines & turbine generator sets, Air & gas compressors, Aircraft engines & parts	3511, 3563, 3724	2	3	2	2
	All engineering subsectors		**6**	**6**	**5**	**5**

Source: GER, CH, UK, Ryan et al., 2011, Table 1; the U.S., own fieldwork

We also matched companies, as far as possible, according to their size. Using the EU classification (European Commission, 2005), the sample includes 14 large companies with 250 or more employees (6 in Germany, 3 in Switzerland, 4 in the UK, 1 in the U.S.) and 8 medium-sized companies between 50 and 249 employees (3 in Switzerland, 1 in the UK, 4 in the U.S.; Ryan et al., 2011). All plants have existed for several years. Regarding volume, our sample comprises different batch sizes, from small to large batches, and all plants followed a quality-oriented strategy, partly with engineered-to-order products.

5.4 Variables, empirical methods, and results

Outcome variable: Span of control

Following classic studies on the span of control (e.g., Bell, 1967; Ouchi & Dowling, 1974), we measure our outcome variable, i.e., the span of control in the production area, by asking "how many employees (skilled and unskilled) work in production" and "how many supervisors and technicians work in production." These questions were comparatively easy for the interviewees to answer, as they merely had to either count the employees and supervisors in the production area or transfer the hierarchical structure from their internal organizational chart.

According to our hypotheses, we divide our analysis into two parts. First, we study the institutional settings and average spans of control at a national level, as in the VoC literature. Second, we study the institutional configurations and spans of control at the company level.

5.4.1 National-level analysis

To test our first two hypotheses, which focus on country-specific averages and ranges of the span of control, we categorize the countries according to the national institutional settings, identified as relevant: VET system, employment protection, coordinated wages, and employee representations.

5.4.1.1 Institutional variables

In measuring the institutional variables, we closely follow the original definitions of Hall and Soskice (2001) and previous empirical literature (e.g., Hall & Gingerich, 2009; Schneider, Schulze-Bentrop & Paunescu, 2010).

(1) VET system

The few studies on the VoC that measure "vocational education and training" (e.g., Schneider, Schulze-Bentrop & Paunescu, 2010; Paunescu & Schneider, 2004) use the OECD "Education at Glance" data on the number of tertiary-type A (academic) graduates and tertiary-type B (occupational) graduates, each measured as a percentage of the population in the typical graduation age (OECD, 2009f, Table A3.1/2). We build a ratio to obtain a better impression of the relative importance of each particular path. In 2007, Germany had more than twice (2.3) the number of general university graduates as tertiary occupational graduates (23% academic, 10% occupational); in Switzerland, the relative number of tertiary academics was a

little lower (1.7, 31% academic, 18% occupational); in the UK, the ratio was a little higher (2.6, 39% academic, 15% occupational). The U.S. had almost four times (3.7) more tertiary type-A program graduates (37% academic, 10% occupational) in 2007.

As the first measure is consistent with the previous literature, but focuses strongly on tertiary education, we use upper secondary enrollment patterns as a "robustness check." The OECD (2009f, Table C1.4) has calculated the proportion of young people pursuing academic (general) or occupational (pre-vocational and vocational) programs at the upper secondary level. Switzerland has the highest enrollment in occupational programs (64.8%), followed by Germany (57.4%) and the UK (41.4%). The U.S. has a value of 100% enrollment in academic programs[76] (see Chapter 2). Therefore, we conclude that Germany, Switzerland, and the UK are more coordinated regarding the VET system than the U.S.

(2) Employment protection

To measure the degree of employment protection, previous literature commonly uses the OECD index of the strictness of employment protection (OECD, 2008; e.g., Schneider, Schulze-Bentrop & Paunescu, 2010; Hall & Gingerich, 2009). The OECD index is comprised of three variables: protection of permanent workers against dismissal, regulation of temporary forms of employment, and specific requirements for collective dismissal. A high index represents strong barriers to (or high costs of) staff reduction through the termination of employment contracts. As manual workers in the manufacturing industry are usually permanent (which is also the case in our sample), we use the index values that measure the protection of permanent workers as crucial variables and use the overall protection index as additional information. The protection index values, both for permanent workers and overall, show a clear gap between Germany (2.85/2.63) on the one side and the U.S., the UK, and Switzerland on the other (0.56/0.85, 1.17/1.09, 1.19/1.77). Thus, we conclude that the U.S., the UK, and Switzerland are clearly more liberal than Germany regarding employment protection.

[76] Though apprenticeship training exists in the U.S., it is not reflected in the statistics because "U.S. registered apprenticeship training programs" usually require a minimum age of 18 years and a high-school degree or equivalent (Crosby, 2002; Glover & Bilginsoy, 2005; Bilginsoy, 2003). Overall, registered apprenticeship training programs show only low enrollment figures. The number of active apprentices was almost 380.000 in 2010 (U.S. Department of Labor, 2011), which is a small number compared to the cohort of high school graduates of more than 3.3 million in 2010 (U.S. Department of Education, 2011, Table 110).

(3) Collective bargaining

Consistent with previous literature, we measure both the coverage by collective bargaining agreements and the level of wage centralization (Schneider, Schulze-Bentrop & Paunescu, 2010; Hall & Gingerich, 2009).

The majority of employees in Germany are covered by collective bargaining (63% in 2007, ICTWSS database, 2009), the coordination of wages is categorized at the second highest index value (4) meaning that mixed industry and economy-wide bargaining takes place in Germany (ICTWSS database, 2009). In contrast, in the U.S., wage bargaining occurs predominantly at the company level (index value 1), and the coverage by collective agreements was very low with only 13% in 2007. Also in the UK, fragmented bargaining at the company level takes place; the coverage was with approximately 35% almost three times higher than in the U.S. Switzerland takes the middle position. Coordination of wages takes place at the industry level, with some additional local and company bargaining (index value 3, ICTWSS, 2009). Switzerland had 48% of collective bargaining coverage of employees (ICTWSS, 2009). In sum, we categorize Germany as coordinated, the U.S. as liberal, and Switzerland and the UK as lying in between.

(4) Employee representation

To measure employee representation, we cannot follow previous empirical VoC-literature, as this variable has not been included yet. We, therefore, decided to, use two comparative indexes of the ICTWSS database (2009), which reflect the existence and influence of employee representation at the national level.

The first index measures whether an employee representation at the enterprise, firm, or establishment level (with 50 or more employees) is mandatory by law or by agreements between the central organizations of trade unions and employers' associations; the index also reflects the coverage of employee representation. In Germany and the UK, employee representation is, according to the ICTWSS database (2009), assured by law or agreement; the coverage, however, is higher in Germany (75% or more of eligible firms, index value of 2) than in the UK (less than 75% of eligible firms, index value of 1). According to the index of the ICTWSS database (2009), the employee representation in the U.S. and Switzerland is absent (coverage of less than 25%, index value of 0).

The second index of the ICTWSS database (2009) measures the influence and rights of employee representation. While employee representation in Germany has the most influence,

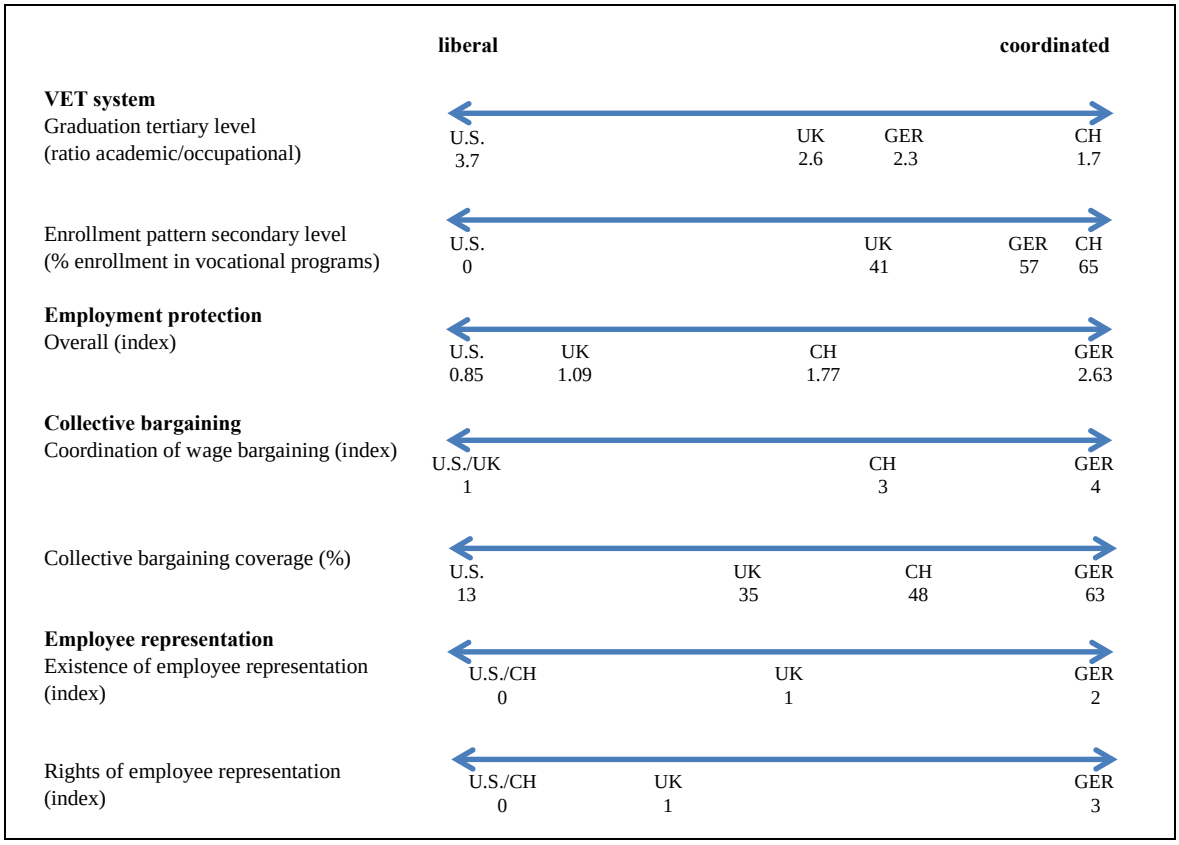
with its codetermination rights for company economic policies (index value 3), employee representation in the UK has only information rights (index value 1). The U.S. and Switzerland both have the lowest index value (0) because employee representation is absent.

Therefore, we again find Germany and the U.S. at polar ends, with the UK again lying somewhere in between. Switzerland has in these variables a strong tendency to the liberal side[77].

Taking all four institutional variables together (Table 5-2), two polar cases of liberal and coordinated shape exist (the U.S. and Germany), which are characterized by coherent institutional settings in terms of the dimensions of VET systems, employment protection, wage coordination, and employee representation. Switzerland and—in contrast to previous literature (e.g., Kenworthy, 2006)—the UK build the less coherent cases because both of these countries combine more coordinated with more liberal institutions relevant for the span of control. While both countries have low employment protection, Switzerland has a strong VET system, which is also existent in the UK (at least numerically, quality differences are discussed below). Switzerland is more coordinated in the wage coordination dimension than the UK but has less employee representation. Therefore, we situate these two countries as mixed cases between the two polar cases Germany and the U.S.

[77] In the VoC approach, the financial and ownership structures of the company play a major role. However, these variables have no direct connection to the span of control but are indirectly related via their influence on the type and extent of training. Listed companies with dispersed ownership structures (no dominant owner) are under higher pressure to maximize their short-term revenues than, for example, family-owned companies or those with a principal stockholder who can afford long-term investments that are associated with smaller short-term revenues. Therefore, listed companies with dispersed ownership make few or no investments in a sound knowledge base that improves long-term performance but diminishes short-term results. Instead, these companies offer short and low-investment on-the-job training. According to the VoC approach, companies in LMEs usually manifest this shareholder-oriented strategy. In contrast, companies that do not face strong shareholder pressure but are able to focus on all types of stakeholders can provide long-lasting and high-investment training with on- and off-the-job periods (the classic example is apprenticeship training). The VoC approach suggests that companies in CMEs are more likely to show this training behavior. Analyzing this ownership-training relationship in a German-Swiss-UK comparison, Ryan et al. (2010a) show some evidence that the expected ownership effects exist for the two sectors—manufacturing and retailing—that they examine. However, the effects are only moderate, in particular when compared to the influence of the skill requirements set by the product market. Given these empirical results, given that no direct effect between ownership and the span of control exists, and given that our small case number limits our ability to include a larger number of explanatory variables (see company-level analysis), we leave financial and ownership structures out of the analysis but attempt to capture their effect on the organizational structure via our training variable.

Table 5-2: Overview of national-level institutions



Graduation tertiary level: Ratio of tertiary-type A (academic) graduates and tertiary-type B (occupational) graduates.

Enrollment pattern secondary level: Percentage of young people enrolled in occupational (pre-vocational and vocational) programs at the upper secondary level.

Coordination of wage bargaining: Index value 5, economy-wide bargaining, based on a) enforceable agreements between the central organizations of unions and employers affecting the entire economy or entire private sector, or on b) government imposition of a wage schedule, freeze, or ceiling. Index value 4, mixed industry and economy-wide bargaining: a) central organizations negotiate non-enforceable central agreements (guidelines) and/or b) key unions and employers associations set pattern for the entire economy. Index value 3, industry bargaining with no or irregular pattern setting, limited involvement of central organizations and limited freedoms for company bargaining. Index value 2, mixed industry- and firm-level bargaining, with weak enforceability of industry agreements. Index value 1, none of the above, fragmented bargaining, mostly at company level.

Collective bargaining coverage: ranges between 0-100%, employees covered by wage bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargaining, expressed as percentage, adjusted for the possibility that some sectors or occupations are excluded from the right to bargain.

Employment protection overall: Compiled from 21 items covering three different aspects of employment protection: Individual dismissal of workers with regular contracts, additional costs for collective dismissals, and regulation of temporary contracts, scale from 0 (least stringent) to 6 (most restrictive).

Existence of employee representation: Works councils, or provision for the information, consultation and co-decision rights of employees in firms and establishments with 50 or more staff: Index value 2, employee representation at the level of enterprises, firms or establishments (above the threshold of 50 employees) is mandatory, based on public law, and or assured on the basis of an enforceable central or basic agreement between the central organizations of trade unions and employers' associations; and coverage of eligible employees is 75 or more. Index value 1, employee representation at the level of enterprises, firms or establishments (above the threshold of 50 employees) is mandatory, based on public law, and or assured on the basis of a enforceable central or basic agreement between the central organizations of trade unions and employers' associations; but coverage is lower than 75 percent of eligible firms. Index value 0, employee representation at the level of enterprises or firms is absent or voluntary, and covers only some sectors or firms (less than 25 percent of firms above 50 staff threshold).

Rights of employee representation in firms, enterprises, or establishments: Index value 3, works council or employee representation body has co-decision rights regarding company economic policies (mergers and acquisition, investments and divestments, appointments to the board, etc.; includes legal sanctions in case of breaching procedures for co-decision). Index value 2, works council or employee representation body has major consultation rights concerning social policies, including wage grading, training, job evaluation, procedures for recruitment and dismissal, etc. (includes legal sanctions in case of breaching procedures for consultation). Index value 1, works council or employee representation body has information rights concerning company policy in social and economic matters (with weak or absent sanctions). Index value 0, employee representation in firm, enterprise or establishment is absent.
Sources: OECD (2009f), OECD (2008), ICTWSS database (2009)

5.4.1.2 Results

The analysis at the national level of the matched-pair engineering plants in the four countries shows that the average span of control differs between the four countries. While our U.S. companies show the narrowest average span of control with only 7.1 employees per supervisor in the production area, German companies have on average the broadest span of control with 26 employees per supervisor (Table 5-3, row one).

These results confirm our first hypothesis that companies in a coherently liberal market economy have a narrower span of control than those in a coherently coordinated market economy.

Table 5-3: Span of control in matched-pair engineering companies in the U.S., Germany, the UK, and Switzerland

country	U.S.	UK	CH	GER
average span of control	**7.1**	**10.3**	**13.6**	**26.0**
max	13.0	23.6	29.5	53.7
min	2.9	4.1	5.5	17.6
range (max-min)	**10.1**	**19.5**	**24.0**	**36.1**

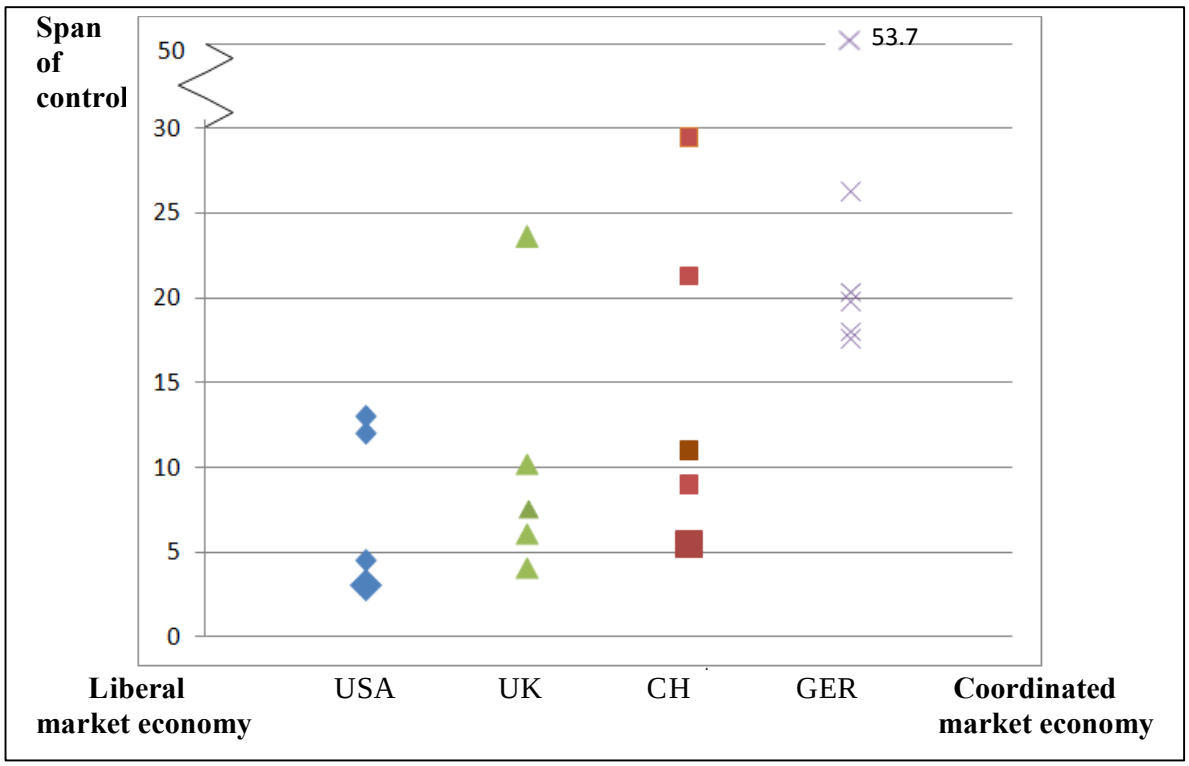
Note: Span of control is defined as number of employees per supervisor in production
Source: own calculations

In every country, we find variation in the span of control (Table 5-3, rows 2 through 4). While the companies in the more coherent liberal market economy show a relatively consistent "cluster," in the sense that the span of control varies only within a range of around 10 employees more or less per supervisor (range from minimum to maximum is 10.1 in the U.S.), companies in less coherent market economies show less consistent clusters (range from minimum to maximum is 19.5 in the UK and 24.0 in Switzerland). In the more coherent

coordinated labor market economy, we find also a broad range from minimum to maximum (36.1 in Germany). However, in contrast to the companies in the less coherent labor market economies, we find in Germany no company that has a span of control, which is close to the narrow spans of control of U.S. companies. Instead, we find that one German company has a span of control of even more than 50 employees per supervisor.

The medium average span of control in Switzerland and the UK derives from a combination of companies that have either a broad span of control that is close to German companies or a narrow span of control that is close to U.S. companies. This pattern is shown in Figure 5-1, which also illustrates that in the less coherent countries a medium range of control spans of around 12 to 20 does not exist. Instead, all of the companies are either in the upper or the lower part.

Figure 5-1: Span of control in the participating companies



Source: own calculations

Therefore, our results support the second hypothesis that companies in less coherent market economies (Switzerland and the UK) show more variation in the span of control than companies in more coherent market economies (the U.S. and Germany).

5.4.2 Company-level analysis

In the following sections, we analyze institutional configurations at the company-level. To do so, we use the method of qualitative comparative analysis (QCA) because more and different institutional configurations also within a country are possible that may be associated with the same type of organizational structure.

5.4.2.1 Methodology: Crisp-set qualitative comparative analysis

To understand the relationship between company-level institutional configurations and the span of control, one has to take into account the interplay of institutions themselves as described in the VoC. As this interplay cannot be tested using linear regression models, particularly not with a small sample, we use configurational comparative methods such as the "qualitative comparative analysis" (QCA) (Rihoux & Ragin, 2009). This type of analysis has already proven useful for testing VoC propositions and for conducting cross-country comparisons (e.g., Kogut & Ragin, 2006; Boyer, 2004; Schneider, Schulze-Bentrop & Paunescu, 2010; Ebbinghaus & Visser, 1999). The underlying principle of QCA is to define cases as combinations of attributes; thus each case is coded for having membership in a set of "causal conditions" (in this case, the conditions are the institutional variables).

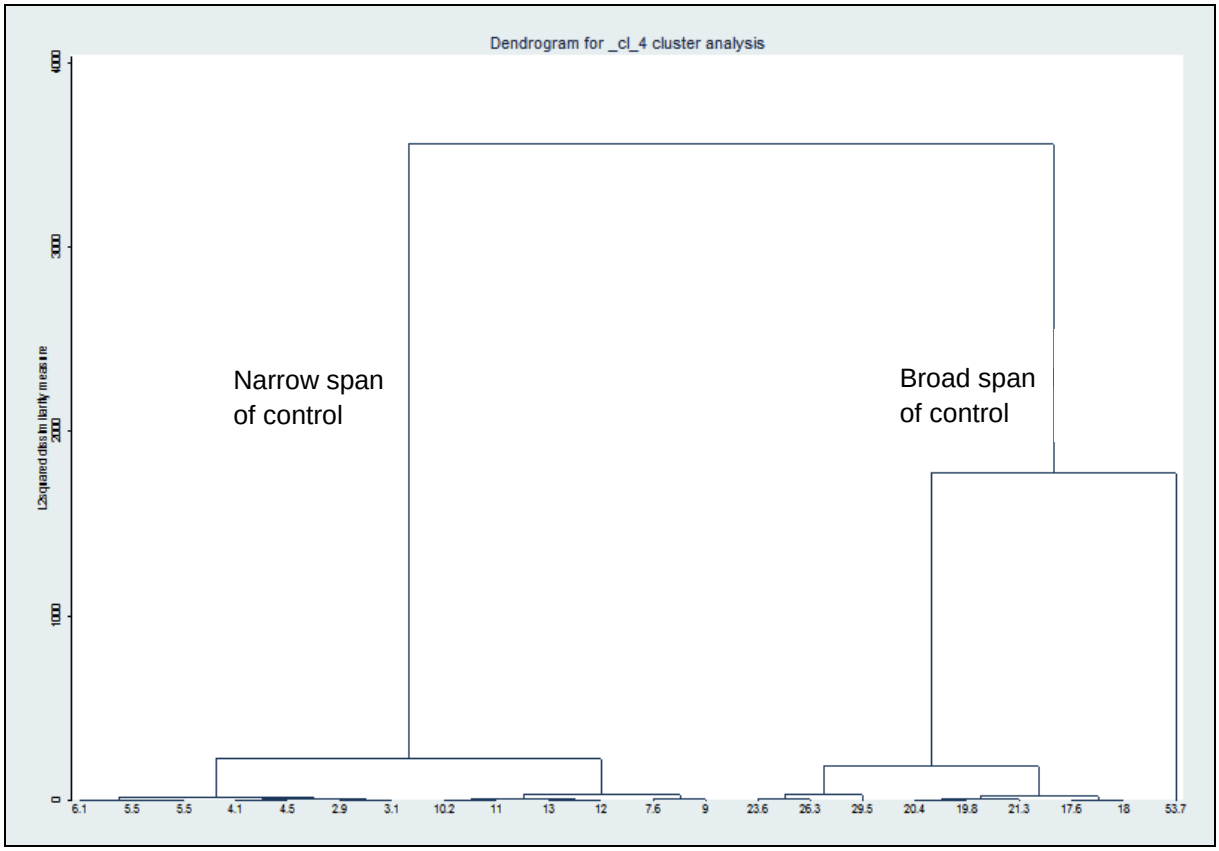
As most of our institutional variables at the company level are binary (e.g., collective bargaining agreement at the industry level is existent or not), we use the crisp-set QCA (csQCA) method. To use this method, all variables are coded dichotomously with (1, 0), which determines whether a case is "in" or "out" of a set. This information is then summarized in a truth table and reduced with Boolean logic. The resulting statements indicate whether single or combinations of variables are necessary and sufficient, respectively. This approach thus allows a formal analysis of qualitative information using small data sets. Moreover, csQCA allows insights into whether multiple configurations (combinations of institutional variables) are associated with the same outcome (equifinality; Fiss, 2007) and allows the measurement of "coverage" (the relative importance of different paths to an outcome) and "consistency" (the proportion of cases consistent with the pattern). The following subsection describes the categorization of the variables that we use in the csQCA.

5.4.2.2 Coding of outcome variable and institutional variables

Outcome variable

To use the csQCA, we need to get binary values for our dependent variable. As no absolute values exist to define a broad or a narrow span of control, we cluster our data points using Ward's linkage-method, which minimizes the sum of squares of any two (hypothetical) clusters, that can be formed at each step. Figure 5-2 shows that we find a cluster with a broad span of control (from 17.6 to 53.7) and a cluster with a narrow span of control (2.9 to 13).

Figure 5-2: Cluster analysis of control spans



Source: own calculations

To analyze the relationship between company-level institutional variables and the span of control, we also need to measure and code the institutional setting binary at the company level.

Institutional variables at the company level

Even though national-level institutional configurations exist, companies may arrange for a different institutional configuration at the company level, particularly in less coherent

economies. With our company data, we measure the functional equivalents to the national-level institutions (Table 5-4) that were described in section 5.4.1.1.

Table 5-4: Functionally equivalent institutions at the national and the company level

Function	Variables measured at the national level	Variables measured at the company level
Skill foundation	Relative importance of *vocational* training system (graduation and enrollment data, OECD, 2009f)	High-quality vocational training provided by the company (yes=1, no=0)
Skill retention	Employment Protection (indexes, OECD, 2008)	Majority of supervisors internally recruited (yes=1, no=0)
	Coordination of wage bargaining and coverage (ICTWSS database, 2009)	Covered by an external and wage-relevant collective bargaining agreement (yes=1, no=0)
Trust	Existence and rights of employee representation (ICTWSS database, 2009)	Strong employee representation at the plant level (yes=1, no=0)

(1) VET system

A VET system lays the necessary skill foundation for autonomously working and highly skilled employees and thus allows a broad span of control. Although vocational training may be widely dispersed at the national level, companies may still choose not to train their employees within the VET system or, depending on the industry and the company, the vocational training may be of low quality. Using the interview data, we code the variable apprenticeship training as 1 if the company trains young workers in a formal apprenticeship program and 0 if it does not. While all of the German, Swiss, and UK engineering companies in the sample have apprenticeship training, the U.S. companies do not.

We code UK Apprenticeship training[78] the same way as in Switzerland and Germany, although UK Apprenticeship training has been criticized for being of lower quality and not

[78] Since the mid-1990s, Modern Apprenticeship (MA) was introduced and reformed several times in the UK. Three different levels of Apprenticeship training exist: the (Foundation) Apprenticeships at National Vocational Qualification (NVQ) Level 2, Advanced Apprenticeship at NVQ Level 3, and Higher Apprenticeships equivalent to a university degree (NVQ Level 4). Engineering apprentices are usually at Level 3.

comparable to the continental variant. The quality in the UK varies depending on the sector. While Apprenticeship training in retailing is rather short (usually one year) and of low quality because of weak regulations and standards, Apprenticeship training in engineering is usually rather comparable to the high quality apprenticeship training found in Germany and Switzerland. The UK is therefore a mixed-case in itself in this dimension. Approximately 190 apprenticeship "frameworks" (consisting of a number of qualifications and certificates) ensure, at least formally, that apprentices have the skills and knowledge for their training occupation. Sector Skills Councils determine the Apprenticeship training content and the skill requirements. Particularly in traditional apprenticeship sectors, such as engineering, most apprentices receive off-the-job training (approximately 70%, Fong & Phelps, 2008) and receive about 10 hours of off-the-job training per week (Ullman & Deakin, 2005; Ryan et al., 2010b). Although official requirements in the UK may be more lax than those in Germany or Switzerland for content and off-the-job training, some excellent examples still exist. In our UK company sample, the average amount of external training in the first year was over 80% of the training time, meaning that the apprentices received not only theoretical but also practical training from the external training provider—a result comparable to those in training centers in Germany or Switzerland. We therefore code the UK apprenticeship cases like the German and Swiss cases, as 1, and the U.S. as 0, because no U.S. company in our sample has either apprentices or a comparable high-quality training program for new employees.

(2) Employment protection and internal labor markets

As high employment protection decreases employees' incentive to change employers and increases their incentive to invest in company-specific knowledge and internal careers, companies in countries with high employment protection will likely be better able to retain skills. However, companies in countries with low employment protection may still succeed in building internal labor markets that provide security about reliable career options, ensure mutual interest in cooperative behavior and a pool of experienced supervisors.

We therefore measure directly the strength of the internal labor markets, i.e., the recruitment behavior at the supervisory level. The company data illustrates that some companies, even in countries with low employment protection (e.g., the U.S.), recruit the majority (more than 50%) of their supervisors internally (Table 5-5).

Table 5-5: Percent of supervisor positions filled by internal candidates

U.S.	UK	CH	GER
US-1 100	UK-1 96	CH-1 25	GER-1 80
US-2 35	UK-2 90	CH-2 0	GER-2 80
US-3 99	UK-3 90	CH-3 50	GER-3 90
US-4 5	UK-4 80	CH-4 90	GER-4 80
US-5 100	UK-5 85	CH-5 60	GER-5 80
		CH-6 20	GER-6 60

Data source: GER, CH, UK, Ryan et al., 2011, Table 14; the U.S., own fieldwork
The question for the general recruitment strategy was: "How do you typically fill your vacancies for production supervisors and technicians?"

We coded all companies as 1 (= strong internal labor market) if they follow an internal strategy, i.e., when the company usually recruits the majority (over 50%) of its supervisors internally. The other companies were coded as 0 (= weak internal labor market).

(3) Wage coordination

Coordinated wage setting at the industry level (or higher) reflects a high level of employer coordination and corporatism, thus reducing the risk of poaching and supporting the retention of skills within the company. However, establishing a country-level categorization based on collective bargaining figures has become more difficult. Even though a country such as Germany has high coverage by collective agreements negotiated at the industry level, this categorization does not necessarily apply to each industry or company. Even the existence of an industry-level collective agreement does not automatically include wage coordination. For example, in Switzerland negotiations at the industry level take place; however, the collective bargaining agreement in the Swiss engineering sector leaves pay to individual agreement between the employer and employee (ASM et al., 2006: Art. 15.2). Thus, from a company perspective, no formal wage coordination exists in the Swiss engineering industry. The between-sector heterogeneity and the importance of exploring the contractual details increase the necessity of analyzing the company-level institutional setting.

We therefore measure directly whether a company is covered by an external, wage-relevant collective bargaining agreement. All German companies were tariff companies with a wage-relevant collective bargaining agreement that was negotiated at the industry level. Therefore, all German companies are coded as 1 (= industry wage coordination present). None of the U.S., UK, or Swiss companies was covered by an external and binding wage-

relevant collective bargaining agreement, so we coded all of these companies as 0 (= no formal industry wage coordination).

(4) Employee representation

The existence of, and a company's cooperation with, an employee representation increases trust and creates a cooperative environment ensuring that workers use their discretion in the interest of the company and allowing a broad span of control. We therefore measure directly whether an employee representation exists within the company.

In our sample, no U.S. company reported on having established something like an employee representation, a finding that is consistent with the national categorization. Conversely, all German manufacturing companies had a works council. In the UK, only one company had employee representation, and in Switzerland, five out of six companies reported on having one, a finding contradicting the national categorization. Under Swiss labor law, more precisely the "*Mitwirkungsgesetz*" (law on participation) of 1993, employee representation plays a more minor role than under German law. However, Swiss employee representation still has the right to be informed about company issues (Article 9) and there are special participation rights provided for employee protection and security, change of ownership, financial security measures, and mass layoffs (Article 11). As mentioned previously, weaker employee representation than German works councils can still contribute to a cooperative environment, particularly if it has certain rights regarding employee protection. Therefore, we code the presence of employee representation as 1, and its absence as 0.

5.4.2.3 Results

Table 5-6 summarizes the institutional configurations in our sample. In contrast to the measurements of institutional variables at the national level, company-level measurement allows us to identify various configurations of institutional variables also within countries.

Table 5-6: Company-level institutional configurations in the sample

Configurations of company-level institutional variables	Apprenticeship Training	Internal Recruitment of Supervisors	Wage Bargaining	Empl. Represen-tation	Number of companies	Number of companies in countries			
						U.S.	UK	CH	GER
1	1	1	1	1	6				6
2	1	1	0	1	3		1	2	
3	0	1	0	0	3	3			
4	1	1	0	0	4		4		
5	0	0	0	0	2	2			
6	1	0	0	1	3			3	
7	1	0	0	0	1			1	

Overall, we find seven different configurations in our sample. All six German companies show the same configuration of institutional variables (Table 5-6, row one). We find variation in one variable in the U.S. (three U.S. companies have strong internal labor markets, two have weaker ones, Table 5-6, rows three and five) and the UK (one company has an employee representation, Table 5-6, row 2), and variations in two variables in Switzerland (in the employee representation variable and the internal labor market variable, Table 5-6, rows two, six, and seven).

Therefore, we cannot reject our third hypothesis that companies in less coherent market economies show more company-level institutional configurations than companies in more coherent market economies.

To analyze our fourth hypothesis that only a coherently coordinated configuration of institutional variables is associated with a broad span of control, we now use the QCA analysis. According to the truth table, two consistent institutional configurations (Table 5-7, rows one and two) are associated with a broad span of control.

Table 5-7: Truth table company analysis—institutional configurations associated with a broad span of control

Configurations of company-level inst. variables	Apprenticeship Training	Internal Recruitment of Supervisors	Wage Bargaining	Empl. Represen-tation	N	Outcome Broad span of control	raw consistency
1	1	1	1	1	6	1	1.0
2	1	1	0	1	3	1	1.0
3	0	1	0	0	3	0	0.0
4	1	1	0	0	4	0	0.0
5	0	0	0	0	2	0	0.0
6	1	0	0	1	3	0	0.0
7	1	0	0	0	1	0	0.0

After reduction using Boolean algebra (see Table 5-8), the results suggest that one institutional configuration is associated with a broad span of control: apprenticeship training, employee representation, and high internal recruitment of supervisors.

Table 5-8: Results QCA analysis at the company level – broad span of control

	Broad span of control
Apprenticeship training	●
Internal recruitment of supervisors	●
Wage coordination at industry level	
Employee Representation	●
Consistency	1.0
Raw/Unique Coverage	1.0/1.0
Solution Coverage/Consistency	1.0/1.0

● = Condition present ○ = Condition absent

Notes:
Raw coverage measures the proportion of memberships in the outcome explained by each term of the solution.
Unique coverage measures the proportion of memberships in the outcome explained solely by each individual solution term (memberships that are not covered by other solution terms).
Consistency measures the degree to which membership in each solution term is a subset of the outcome.
Solution coverage measures the proportion of memberships in the outcome that is explained by the complete solution.
Solution consistency measures the degree to which membership in the solution (the set of solution terms) is a subset of membership in the outcome.

The configuration of the three institutional variables represents all three functions that were identified in section 5.2 and suggests that the complementary existence of all three functions is necessary to end up with a broad span of control. Apprenticeship training ensures the necessary skill foundation for a broad span of control. Strong internal labor markets ensure a high stock of company-specific knowledge and the retention of skills within the company. Finally, employee representation increases trust between management and employees. Even when this employee representation is weak compared to, for example, German works councils, it appears to increase trust and employee motivation, thus reducing the need for tight supervision.

We therefore cannot reject our fourth hypothesis that only companies with a coherently coordinated company-level institutional configuration show a broad span of control. Moreover, companies in less coherently coordinated national-level institutional settings can end up with a broad span of control when they use the coordinated institutions that are available and compensate for national-level liberal institutions with company-level

coordinated institutions. Thus, companies in less coherent market economies can compensate for low employment protection and legally non-required employee representation by having strong internal labor markets and a company-level employee representation.

To test our fifth hypothesis, we analyze the configurations of company-level institutional variables that are associated with a narrow span of control. Five consistent combinations are associated with a narrow span of control (Table 5-9, rows one to five).

Table 5-9: Truth table company analysis—institutional configurations associated with a narrow span of control

Configurations of company-level inst. variables	Apprenticeship Training	Internal Recruitment of Supervisors	Wage Bargaining	Empl. Represen-tation	N	Outcome Narrow span of control	raw consistency
1	1	0	0	0	1	1	1.0
2	1	1	0	0	4	1	1.0
3	0	1	0	0	3	1	1.0
4	1	0	0	1	3	1	1.0
5	0	0	0	0	2	1	1.0
6	1	1	0	1	3	0	0.0
7	1	1	1	1	6	0	0.0

Again, these configurations can be reduced by Boolean algebra (see Table 5-10) with the result that two configurations are associated with a narrow span of control: a) apprenticeship training, non-existent wage coordination, and weak internal labor markets and b) non-existent employee representation and non-existent wage coordination.

Table 5-10: Results of QCA analysis at the company level – narrow span of control

	Narrow span of control	
	Configuration 1	Configuration 2
Apprenticeship training	●	
Internal recruitment of supervisors	○	
Wage coordination at industry level	○	○
Employee Representation		○
Consistency	1.0	1.0
Raw/Unique Coverage	0.31/0.23	0.77/0.69
Solution Coverage/Consistency	1.0/1.0	

● = Condition present ○ = Condition absent

Notes: see Table 5-8

The results suggest that not all company-level institutional variables need to be liberal to end up with a narrow span of control. When the function of skill retention is missing, even the existence of apprenticeship training and, therefore, the possession of the necessary skill foundation is not associated with a broad span of control.

Regarding our fifth hypothesis, we therefore find no evidence that all company-level institutional variables need to have a liberal shape to be associated with a narrow span of control. Instead the absence of one function seems to be already enough to end up with a narrow span of control.

5.5 Discussion and conclusion

This paper analyzes the question of how matched-pair engineering companies adapt their organizations to more or less favorable and more or less coherent national institutional settings of Germany, Switzerland, the UK, and the U.S.

We find that matched-pair engineering companies differ substantially in the span of control of production supervisors depending on the national-level institutional variables. Production supervisors in companies in a coherently coordinated market economy (Germany) have, on average, a broader span of control than production supervisors in companies producing in a coherently liberal market economy (the U.S.). These results are consistent with the VoC approach, which argues that, while U.S. companies fit the institutional setting by relying on hierarchies and rules, German companies fit the institutional setting by relying on cooperation.

In less coherent countries (the UK and Switzerland), companies show a broader range in the span of control variable than their counterparts in the more coherent countries. In Germany, companies build a cluster with a broad span of control; in the U.S., companies build a consistent cluster with a narrow span of control. In the less coherent countries, we find companies that have a broad and companies that have a narrow span of control. By measuring the functionally equivalent institutions at the company level, we are able to identify different institutional configurations within a country. With the QCA analysis, we link the company-level institutional variables to the span of control. The results suggest that a broad span of control is only associated with a coherent set of coordinated institutional variables that fulfill the functions of skill foundation, skill retention, and trust, thus supporting the complementarity argument of the VoC. For a narrow span of control, not all institutional variables need to have a liberal shape.

The small number of cases within each country of course, limits our study. While we address the problems of size with a method suitable for small numbers and rich contexts, our results could be driven by limited diversity. The result that wage coordination at the industry level is not necessary for a broad span of control seems plausible, as the wage-equalizing effects of tariff agreements seem, even in Germany, weaker than theory implies (also tariff companies can and do pay higher wages than agreed). However, the importance of non-existent wage coordination for a narrow span of control is likely due to the limited diversity in our sample because this is the only variable that strictly separates the German cases from the cases in the other countries.

We also cannot provide representative evidence for all engineering companies in each country. For example, our company sample does not include a U.S. company with apprenticeship training, even though "registered apprenticeship training programs" exist in the U.S. engineering industry (Crosby, 2002; Glover & Bilginsoy, 2005; Bilginsoy, 2003). Future research should include these types of cases to analyze whether registered apprenticeship or a similar type of high-quality training is associated with a broad span of control in U.S. companies. A further limitation could be that we do not consider additional factors that could explain—according to economic and organizational literature—the span of control. An example is the complexity of tasks, which is influenced by technology. By matching companies by product and thus by production technology, we aimed to reduce technological influences.

Nevertheless, the possibility exists that the companies we studied vary in the type of work organization they use. A broader span of control is associated with, among other things, stable and routine work and subordinates who perform similar work tasks (e.g., Woodward, 1965; Burns & Stalker, 1961; Mintzberg, 1979). Moreover, the introduction of teamwork or lean production could influence organizational structure. For example, German companies might have fewer supervisors because they have introduced more teamwork than their foreign counterparts. Previous literature, however, shows that a change in work organization has only a limited effect on the number of supervisors. While supervisors' tasks by themselves may change, the introduction of e.g., teamwork does not necessarily lead to a significant increase of the supervisor's span of control—again, the level of skill foundation is of relevance here (Mason, 2000). Furthermore, the possibility of introducing routine work is limited in companies that rely on engineering-to-order. The solution for these companies would be to

introduce a large number of supervisors who break down job tasks for their subordinates. The narrow span of control in the U.S. companies supports this explanation.

Though various limitations exist, this paper contributes to the existing literature by providing, for the first time, evidence addressing the question of how companies adapt their organizations to different national institutional settings that have various degrees of favorability and coherence. Besides showing that the span of control is indeed an important mechanism of adaptation, we provide evidence that companies are not fully dependent on whether the national institutional fulfills the three functions. Instead companies have some strategic leeway in terms of their company-level institutional setting thus being able to determine the presence of the three functions. Therefore, our results have also practice-relevant implications. Multinational companies, for example, that originate in a country with a strong apprenticeship tradition and wish to expand their production to countries without a high-quality vocational training system face a major problem in how to deal with the lack of a skilled workforce. Our results show that the company's adaptation strategy could be either to follow the national institutional setting and to implement of a narrow span of control or to create a company-level institutional setting with high-quality vocational training combined with strong internal labor markets and trust-building institutions thus ending up with a broad span of control.

CHAPTER 6

Final Remarks

Given the large variation in both vocational education and training (VET) systems and labor market institutions across developed economies, the aim of this thesis was to analyze the effects of VET systems and labor market institutions on the personnel and organizational strategies of companies. Educational and institutional factors form the framework in which companies can operate. Therefore, the question arises of how companies behave in different combinations of these two dimensions. Previous literature has mainly focused on Germany and the U.S., highlighting the advantages of apprenticeship training and of general education and emphasizing the complementary relationship between the respective educational and labor market systems (e.g., Hall & Soskice, 2001).

However, little attention has been paid to countries such as Switzerland, which combines both German and U.S. features. Previous analyses of Germany and the U.S. have been unable to differentiate the effects of VET systems and labor market institutions due to simultaneous changes in both dimensions. Therefore, the inclusion of "hybrid" cases, such as Switzerland, in this thesis provides important new insights into the personnel and organizational strategies of companies acting in different VET systems and labor market institutions. The following results are based on a dataset that we gathered by interviewing matched-pair engineering and retailing companies in Germany, Japan, Switzerland, the UK, and the U.S.

Our first main result is that the institutional setting influences the way of how engineering companies in Germany and Switzerland fill their vacancies at the level of skilled production employees. Although some researchers have begun to analyze the costs and benefits of apprenticeship training in Germany and Switzerland (Mühlemann et al., 2007; Schönfeld et al., 2010), little is known about the effects on personnel strategies. Because the length, quality, and certification of German and Swiss VET (i.e., apprenticeship training) are highly similar, it is surprising that personnel strategies vary substantially: While German companies take over almost all their apprenticeship graduates and use them to cover their

(long-term) personnel needs, the percentage of Swiss apprenticeship graduates taken over and used to fill vacancies in the training company is comparatively low. The analysis shows, first, that labor market institutions are responsible for comparatively lower training costs in Switzerland than in Germany, thus reducing the necessity of retaining all apprentices to cover training costs. Second, because the occupational labor market is more volatile, Swiss companies do not wait until their apprentices graduate; instead they fill their vacancies as they arise. Third, Swiss companies are able to do so as labor market institutions, such as employee representation and collective bargaining agreements, do not push for a high takeover rate of apprentices, as is the case in Germany. Finally, a low level of employment protection in Switzerland suits the stronger external recruitment strategy because it reduces the necessity for screening potential employees during apprenticeship training. In sum, we find stronger occupational labor markets and less long-term personnel planning in Switzerland than in Germany due to the different labor market institutions.

The first results show that labor market institutions explain country-specific differences in recruitment strategies. Therefore, we analyze in the next step, whether differences in labor market institutions and VET systems can explain why companies' shares of internal promotions to the supervisory level are more prominent in some economies than in others. Despite the valuable insights of previous literature, little empirical evidence has examined within- and between-country differences in internal labor market structures and companies' promotion patterns.

Our second main result is that the type of VET system and the type of labor market institutions has separate effects on internal labor markets, as measured by the percentage of internal promotions to the supervisory level. Using an analytical matrix that combines results from economic and institutional literature, we find, first, that companies that provide company-specific and non-certified VET show a higher percentage of internal promotion than their counterparts with occupation-specific and certified VET. Second, companies that act in more coordinated labor market institutions show a higher percentage of internal promotion than their counterparts acting in more liberal labor market institutions. Therefore, companies in both Japan and Switzerland constitute "complementary" cases as in these companies both dimensions—VET and labor market institutions—reinforce each other's effect on internal labor markets. In contrast, German and U.S. companies constitute "mixed" cases, in which VET and labor market institutions weaken each other's effect on internal promotions. These findings contrast—at least regarding internal promotion patterns—with previous literature that

stresses the strong complementarities of (vocational) education and training systems, and labor market institutions in Germany and the U.S. (Hall & Soskice, 2001).

Given that VET systems and labor market institutions not only influence personnel strategies but also contribute to industry-specific competitive advantages, and given that the German complementary combination of both VET in the form of dual apprenticeship training and coordinated labor market institutions (which support internal labor markets) creates a competitive advantage for engineering companies, the question arises of how matched-pair companies adapt to national institutional settings that are less favorable and less coherent, such as those in Switzerland, the UK, and the U.S.

Our third main result is that matched-pair engineering companies differ substantially in their span of control of production supervisors depending on the national-level institutional setting. Production supervisors in companies in a coherently coordinated market economy (Germany) have, on average, a broader span of control than production supervisors in companies producing in a coherently liberal market economy (the U.S.). These results are consistent with the argument of the VoC approach: U.S. companies fit the institutional setting by relying on hierarchies and rules, whereas German companies fit the institutional setting by relying on cooperation. In less coherent countries (the UK and Switzerland), companies show a broader range in the span of control variable than do their counterparts in more coherent countries. In Germany, companies build a cluster with a broad span of control; in the U.S., companies build a consistent cluster with a narrow span of control. In the less coherent countries, we find companies that have a broad and companies that have a narrow span of control. By measuring functionally equivalent institutions at the company level, we are able to identify different institutional configurations within countries. Using QCA analysis, we link the company-level institutional variables to the span of control and find that a broad span of control is only associated with a coherent set of coordinated company-level institutions (apprenticeship training, strong internal labor markets, and employee representations) that ensure the three functions of skill foundation, skill retention, and trust. For a narrow span of control, not all institutional variables must have a liberal shape.

In sum, our results show the effects of VET systems and labor market institutions on personnel and organizational strategies. Together with the qualitative information that we gathered during our interviews, our findings point to several policy implications.

We connect with the OECD's critique of countries with strong VET systems—in particular apprenticeship training—that they need to increase their share of academic students to remain competitive (OECD, 2003; OECD, 2009f)[79].

We first argue that the other side of the coin of increased academic training is automatically a reduction in the number of young people who follow the vocational track, which may create substantial problems in finding suitable apprenticeship applicants, as was the case some UK companies we interviewed. Although our results in chapter 5 show that companies have the possibility to compensate for missing qualifications in their workforce with a narrow span of control, only apprenticeship training and, thus, skilled employees offer companies the choice of how to organize.

Second, a decreasing supply of suitable apprenticeship applicants (or the pressure from unions) can lead to increases in apprentices' pay and thus to increased training costs for companies. This cost increase, however, has a major impact on the personnel strategy. Our results in chapter 3 show that the consequences include stronger internal recruitment at the level of skilled employees. Thus, companies and individuals may risk losing the advantages associated with strong occupational labor markets, such as flexibility and optimal allocation of skilled employees.

Finally, we interviewed engineering companies that act in environments with a high share of academic students and whose personnel managers told us, *"It is unfortunate that we don't have apprenticeship programs today because business and industry could benefit from an apprenticeship program."* A personnel manager in a company that had ended its apprenticeship program some years ago said: *"It was short-sighted to close apprenticeship down, today it is not less expensive to train the new employees—they get full wage today."* Companies realize that they are lacking the people with intermediate skills that can realize the ideas of the university graduates and interact with them, thus creating even better ideas.

In sum, pushing academic education in countries with strong VET systems may not be necessary. This thesis has shown that different but equal kinds of personnel strategies or ways of organizing companies exist depending on country-specific VET systems and labor market institutions.

[79] The dual apprenticeship system is also criticized as being unsustainable in the future ("Die duale Berufsbildung ist ein Auslaufmodell", NZZ, September 1, 2009).

APPENDIX

Questionnaires

Maschinenbauunternehmen mit Auszubildenden GER/CH

I. Eigenschaften des Unternehmens

Welchen Status hat Ihr Unternehmen?

□ Einzelunternehmen
□ Unternehmen innerhalb eines Mehrbetriebunternehmens
Name: _____
□ Geschäftsbereich eines Mehrbetriebunternehmens

Welche Nationalität hat die (Mutter-) Gesellschaft _____

Ist Ihr Unternehmen (oder die Muttergesellschaft) börsennotiert?

□ Ja □ Nein

Falls ja:
Besteht eine Mehrheitsbeteiligung?
(z.B. Einzelperson oder Familienanteile 50%+ des Eigenkapitals)

□ Ja, Identität_____ □ Nein

Welche Produkte stellen Sie hauptsächlich her (und/oder welchen Service)?

_____

Was ist Ihre Position im Produktmarkt?

□ Größter Wettbewerber □ 2./3. □ 4./5. □ 6. oder darunter

Was ist wichtiger, um im Wettbewerb zu bestehen?

□ Qualität □ Preis □ Beides gleich wichtig

In welcher Losgröße werden Ihre Hauptprodukte üblicherweise gefertigt?

□ Große/Mittlere □ Kleine/Einzelfertigung □ Beides

Wie viele Beschäftigte waren in Ihrem Betrieb tätig
(1. Januar 2005 und 1. Januar 2008)?

2008: _____ 2005: _____

Unterteilen Sie Ihre Beschäftigten in der Produktion in die verschiedenen Berufsgruppen
(Nur in der Produktion und Instandhaltung):

	(aktuell) Beschäftigte (1. Jan. falls möglich)
Management/Kaderposition	
Meister und Techniker	
Facharbeiter in der (a) Produktion	
(b) Sonstige Bereiche (Instandhaltung, Werkzeugraum, etc.)	
Angelernte (in Produktion oder in sonst. Bereichen)	
Andere (Auszubildende, Trainees, Praktikanten)	
Gesamt	

Wieviel Prozent Ihrer Facharbeiter sind bei Zeitarbeitsfirmen beschäftigt?

Zeitarbeit: Zahl oder % _____

Wie hoch ist die Fluktuation in Ihrem Unternehmen?
(Jahr 2007, nur Kündigungen und Entlassungen, wenn möglich keine Pensionierungen einbeziehen)

Gesamt: _____% pro Jahr
Facharbeiter: _____ % pro Jahr
Meister und Techniker: _____ % pro Jahr

II. Qualifikationserwerb

Wie besetzen Sie üblicherweise die Stellen in der Produktion für Facharbeiter und Abteilungsleiter/Meister/Techniker?
Prozentsatz (%) für die beiden Positionen

	Qualifikationsquellen	Vakante Positionen: Facharbeiter	Vakante Positio-nen: Abt.leiter/ Meister/Techniker
Extern	Total		
	Einstellung Facharbeiter		
	Einstellung und Weiterbildung ange-lernter (weniger qualifizierter) Mitarbeiter		
	Einstellung von Absolventen von Fachschulen, FHs, Unis		
Intern	Total		
	Besetzung mit eigenen Azubis, die gerade ihre Lehre abgeschlossen haben		
	Umsetzung erfahrener Fachkräfte		
	Weiterbildung von angelernten Mitarbeitern		
	Gesamt	100%	100%

Was sind die wichtigsten Vor- und Nachteile dieser Rekrutierungsquellen?

Vorteile: _____

Nachteile: _____

Falls Sie Weiterbildungen anbieten, um fachlich gering qualifizierte Angestellte als Fachkräfte einzusetzen:

Was beinhaltet die Weiterbildung für fachlich gering qualifizierte Angestellte?

Woche mit Vollzeitarbeit

	Wochen	%
Off the job - Schulung		
On the job - Schulung		
Sonst		
Gesamt		100%

Wie lange dauert es, bis die volle Qualifikation erreicht ist? _____

Haben Sie in den letzten drei Jahren für diese Positionen Absolventen mit einem Bachelor Abschluss eingestellt? Falls nicht, werden Sie es in den nächsten fünf Jahren tun?

Wurden schon eingestellt □ Ja □ Nein

Für die nächsten 5 Jahre geplant □ Ja □ Nein

Was beinhaltet die Einführungsausbildung für junge Hochschulabsolventen, die für Positionen als Meister oder Techniker ausgebildet werden?

Woche mit Vollzeitarbeit

	Wochen	%
Off the job - Schulung		
On the job - Schulung		
Produktive Arbeit: gelernte Aufgaben		
Produktive Arbeit: ungelernte Aufgaben		
Sonst		
Gesamt		100%

Wie lange dauert es, bis die volle Qualifikation erreicht ist? _____

III. Eigenschaften der Ausbildung

Die folgenden Fragen über die Lehrausbildung beziehen sich auf Facharbeiter.
Was sind Ihre wichtigsten Ausbildungsprogramme? Wie lang ist die Ausbildungszeit? Wie viele Auszubildende sind in den jeweiligen Programmen?

	Name/Titel/Beruf	Lehrjahre	Anzahl der Azubis *(aktueller Bestand, über alle Jahre und Ausbildungsstufen)*
1.			
2.			
Gesamt			

Wie viele Auszubildende haben Sie 2007/08 eingestellt und wie viele drei Jahre zuvor? ***Nur Facharbeitstätigkeiten***

2007/08 _____ 2004/05 _____

Die kommenden Fragen bitte in Bezug auf Ihr Ausbildungsprogramm für Facharbeiter beantworten, entweder alle Programme oder das größte. Bitte kreuzen Sie an, was Sie hier angeben.

[Abdeckung: □ Alle Facharbeiter □ nur die größte Gruppe]

Was beinhaltet Ihre Ausbildung/sind die typischen Ausbildungsbestandteile?
Lehrprogramm für größte Berufsgruppe, Angaben entweder in Stunden oder in prozentualem Anteil der gesamten Stunden pro Woche

Aktivität		Durch-schnitt	Stunden (pro Woche oder %)			
			1. Jahr	2. Jahr	3. Jahr	4. Jahr
"Off the job" Schulung und Ausbildung	Externer Anbieter a. Berufsschule					
	b. spezielles Schulungszentrum/ Seminare					
	Interne Lehrwerkstätte					
"On the job" Schulung (an der Arbeitsstätte)						
Produktive Arbeit: Facharbeitertätigkeit						
Produktive Arbeit: Angelernte Tätigkeiten						
Sonstiges						
Gesamt						100 %

Falls die Auszubildenden normalerweise ein zu geringes Bildungsniveau mitbringen:

Stellen Sie weitergehende Ausbildungsmöglichkeiten zur Verfügung, um das Qualifikationsdefizit auszugleichen?

□ Ja □ Nein

Haben Sie mehr Bewerbungen als Stellen für Ihr Ausbildungsprogramm? Konnten Sie alle Stellen besetzen?

Momentane Situation oder Stand bei letzter Einstellung

□ Unbesetzte Stellen : ____ von _____ offenen Stellen

□ Zu viele Bewerber: ____ von _____ Bewerbern wurden angenommen (nur hinreichend Qualifizierte)

□ Übereinstimmung

Wie alt sind Ihre Auszubildenden, wenn sie die Lehre beginnen?

Stand bei letzter Einstellung

15-17 ____ % 18-20 ____ % 21-24 ____ % 25+____ %

Wie viele Frauen, wie viele Männer sind unter den Auszubildenden?

momentaner Bestand

Männer: _____ % Frauen: _____ % Zusammen: 100 %

Haben Sie spezielle Förderprogramme, um die Rate der Frauen (oder Männer) anzuheben?

□ Ja, für Frauen □ Ja, für Männer □ Nein

Welches Bildungsniveau sollten die Bewerber mitbringen? Welches Niveau haben sie? Wie verteilen sie sich auf die Niveaustufen?

Deutschland	Notwendig	Realität	Anteil
Hauptschulabschluss	□	□	_____%
Realschulabschluss	□	□	_____%
Abitur	□	□	_____%
Schweiz			
Sekundarschulabschluss (C)	□	□	_____%
Sekundarschulabschluss (A,B)	□	□	_____%
Matura	□	□	_____%

Welcher Anteil an Auszubildenden bricht die Lehre vor ihrem Abschluss ab?

(*einschließlich Probezeit falls möglich*)

____ % der Anfänger

Von den Auszubildenden, die ihre Lehre abschliessen, wie hoch ist da die Übernahmequote?

___ % der Auszubildenden erhalten ein Übernahmeangebot

___ %der Auszubildenden akzeptieren das Angebot

Welcher Anteil der Azubis, die ein Jobangebot angenommen haben kündigen innerhalb des ersten Jahres? _____ %

Welcher Anteil von Ihren Meistern und Technikern wurde im Unternehmen als Lehrling ausgebildet? _____%

Welche weitere Ausbildungsmaßnahme ist für ausgelernte Azubis notwendig, um solche Positionen zu erreichen? _____

IV. Ausbildung: Institutionen und Vergütung

Wie hoch ist das durchschnittliche Gesamteinkommen für Fachkräfte und für Auszubildende? Falls sich der Grundlohn unterscheiden sollte, bitte ebenfalls angeben.

		Gesamt-einkommen (Durchschnitt)	Grundlohn (falls abweichend)
Fachkräfte (a) unmittelbar nach der Ausbildung			
(b) Gesamt			
21-jährige angelernte Mitarbeiter			
Auszubildende *Relevantes Kästchen ankreuzen:* □ nach Ausbildungsjahr	□ nach Alter □ keines		
1	16		
2	17		
3	18		
4	19		
	20		
	21^{+}		

Jahr 200 _____

Basis: □ Stündlich □ Wöchentlich □ Monatlich □ Jährlich

Erhalten die Auszubildenden einen Bonus? Falls ja, welcher Art?

Leistungsbezogen? Für einen Einzelnen oder eine Gruppe? Im Tarif einbegriffen? Basierend auf dem Umsatz oder durch Anerkennung vom Vorgesetzten?

□ Ja □ Nein

Erhalten Ihre Auszubildenden Sozialleistungen?

(Freiwillige) Krankenversicherung? Rentenversicherung? Kantine? Urlaub?

□ Ja □ Nein

Die gleichen wie andere Arbeitnehmer?

Wie wird die Vergütung Ihrer Auszubildenden geregelt?

(Tarifverhandlungen, Entscheidung des Managements, Mindestlohn, ...)

_____

Wird das Gehalt der Facharbeiter nach <u>anderen</u> Kriterien und Methoden bestimmt als das Gehalt der Auszubildenden?

□ Nein □ Ja

Falls Nein, zur nächsten Frage übergehen.

Erkennen Sie einen oder einige Gewerkschaftsverbände an?
d.h. für die Aushandlung von Gesamtarbeitsverträgen, entweder durch Ihr Unternehmen oder durch eine Arbeitgebervertreter, der für Sie spricht.

□ Nein □ Ja Name (n): _____

Haben Sie einen Betriebsrat/Personalkommission?

□ Nein □ Ja

Falls ja,: auf welchen Ebenen? □ im Betrieb □ im Unternehmen

Beeinflusst eine der folgenden Organisationen das Gehalt und die Anzahl der Einstellungen bzw. Übernahmen Ihrer Auszubildenden? Falls ja, wie?

Falls 'ja', Einfluss beschreiben:

Arbeitgeberverband	□ Nein □ Ja:	_____
Gewerkschaftsverbände	□ Nein □ Ja:	_____
Betriebsrat/Personalkommission	□ Nein □ Ja:	_____

Gab es in den letzten Jahren deutliche Veränderungen im Verhältnis der Gehälter der Auszubildenden im Vergleich zu den Gehältern der Fachkräfte?

□ Keine Veränderungen □ Eine oder mehrere Veränderungen

Wann? (größte Veränderung) _____
Um wie viel? _____

Gründe _____
Probe: Wählte das Unternehmen die Veränderung?

Falls eine oder mehrere Veränderungen auftraten,

Welche Effekte hatte die Veränderung des relativen Auszubildendengehalts auf die folgenden Schulungs- und Einstellungsmerkmale?

_____

Falls keine Veränderungen auftraten,

Was wäre der Effekt einer erheblichen Veränderung der Auszubildendengehälter (z.B. ein 20%iger Anstieg oder Abfall) auf die folgenden Merkmale?

Alle anderen Umwelteinflüsse bleiben gleich

i. Effekt auf die Anzahl der neu eingestellten und übernommenen Auszubildenden:
   Anstieg der Gehälter _____
   Abfall der Gehälter _____
ii. Gebrauch von anderen Ausbildungsmethoden (Weiterbildung, Neueinstellung, etc.)

_____

V. Organisatorische Merkmale der Ausbildung

Auf welcher Managementebene werden Entscheidungen über das Training von Auszubildenden getroffen?
Ein Kästchen in jeder Spalte ankreuzen

Umfang	Inhalt (nur Training innerhalb des Unternehmens)
□ Zentrale	□ Zentrale
□ Werksebene	□ Werksebene

Haben Sie ein festgesetztes Budget für die Aus- und Weiterbildung?
□ Ja (Höhe: ____ % der Gehaltskosten/Umsatz) □ Nein

Falls ja,
Gibt es ein separates Budget für die Auszubildenden?
□ Ja (Höhe: _____ %) □ Nein

Wie wird mit den Ausbildungskosten, "Off the job" und "On the job" (Schulung an der Arbeitsstätte), in der Buchhaltung umgegangen?
„Off the job"-Ausbildung in einem separaten Ausbildungsbudget □ Ja □ Nein
"On the job"-Ausbildung in einem separaten Ausbildungsbudget □ Ja □ Nein
Kommentar: _____

Werden in Ihrem Unternehmen die Ausbildungskosten für Auszubildende geschätzt?
□ Ja □ Nein □ Keine Angabe
Falls ja,
Von wem wird die Schätzung durchgeführt? _____
Wie hoch sind die Kosten eines Auszubildenden? _____
Ist die analytische Basis der Brutto- oder Nettowert der Arbeitsleistung eines Auszubildenden?
□ brutto (z.B. ohne die Beachtung der Leistung des Auszubildenden)
□ netto (z.B. die Leistung des Auszubildenden wird von den Kosten abgezogen)
Haben die Resultate Ihr Ausbildungsprogramm beeinflusst?

Erhalten Sie Finanzhilfen jeglicher Art von öffentlichen Stellen, um die Ausbildungskosten zu decken?
□ Ja □ Nein □ Keine Angaben
Falls ja,
Finanzquellen: _____
Höhe pro Auszubildenden: _____
Verknüpfte Konditionen: _____

VI. Finanzielle Aspekte

Veröffentlicht Ihr Unternehmen seine Gewinne, z.B. an der Börse?

□ Ja, auf dieser Ebene *(z.B. das Werk ist eine Firma)*
□ Ja, doch nur auf einer höheren Ebene *(z.B. durch die Muttergesellschaft)*
□ Nein
□ Sonstiges (z.B. freiwillige Veröffentlichung oder Veröffentlichung zu einem Teil)

Falls ja,
Wie häufig veröffentlicht Ihr Unternehmen die Gewinne?
□ Jährlich □ Halbjährlich □ Jedes Quartal

Haben Sie den Eindruck, dass die Veröffentlichung der Gewinne oder der Preis der Unternehmensaktien die Ausbildungsbudgets oder –methoden beeinflusst
□ Ja, sehr stark □ Ja, aber nicht sehr stark □ Nein

Nur börsennotierte Unternehmen:
Sind Ihrem Unternehmen in den letzten Jahren an der Börse starke Veränderungen in der Bewertung widerfahren? □ Nein □ Ja

Gab es in den letzten Jahren einen bedeutenden Wechsel der Eigner (z.B. durch eine Übernahme) oder in der Finanzstruktur (z.B. Verstärkte Verschuldung)?
□ Ja □ Nein
Falls Ja, **Jahr:** _____
Inhalt:
_____

Falls Ja zu einer von beiden Fragen:
Wie groß war die Auswirkung auf das Ausbildungsbudget und die –methoden.
□ Signifikant □ keine signifikante Auswirkung
Inhalt: _____

Falls Nein zu beiden,
Welche Entwicklungen hinsichtlich der Ausbildungsbudgets und -methoden erwarten Sie, falls Ihre Firma von einer Private-Equity Gesellschaft gekauft werden würde und mehr Fremdkapital aufnehmen würde (Leverage-Effekt)?
'Leverage': Verhältnis von Fremdkapital zu Eigenkapital
□ Maßgebliche Effekte werden erwartet
□ Keine maßgeblichen Effekte werden erwartet

Wie stark ist der Wettbewerb auf dem Produktmarkt?
□ Stark □ Moderat □ Gering □ Keiner

Welchen Effekt hat der Konkurrenzdruck auf die Ausbildungsmaßnahmen?
□ Wenig oder kein Effekt □ Starker positiver Effekt □ Starker negativer Effekt

Wer sind Ihre stärksten Konkurrenten in Ihrem und in den anderen Ländern unserer Studie und wie ähnlich sind deren Produkte im Vergleich zu den Ihren?

Einzelhandelsunternehmen mit Auszubildenden GER/CH

I. Eigenschaften des Unternehmens

Welchen Status hat Ihr Unternehmen?

□ Einzelunternehmen
□ Unternehmen innerhalb eines Mehrbetriebunternehmens
Name: _____
□ Geschäftsbereich eines Mehrbetriebunternehmens

Welche Nationalität hat die (Mutter-) Gesellschaft _____

Ist Ihr Unternehmen oder die Muttergesellschaft) börsennotiert?

□ Ja □ Nein

Falls ja:
Besteht eine Mehrheitsbeteiligung?
(z.B. Einzelperson oder Familienanteile 50%+ des Eigenkapitals)

□ Ja, Identität_____ □ Nein

Welche Produkte und Dienstleistungen verkaufen Sie hauptsächlich (z.B. Kleidung, …)?
_____

Was ist Ihre Position im Produktmarkt?

□ Größter Wettbewerber □ 2./3. □ 4./5. □ 6. Und darunter

Was ist wichtiger, um im Wettbewerb zu bestehen?

□ Qualität □ Preis □ Beides gleich wichtig

Wie viele Beschäftigte waren in Ihrem Betrieb tätig
(1. Januar 2005 und 1. Januar 2008)?

2008: _____ 2005: _____

Unterteilen Sie die Beschäftigten nach Berufsgruppen (nur in Verkaufsabteilung):

	(aktuell) Beschäftigte (1. Jan. falls möglich)
Management/Geschäftsleitung/Kaderposition	
Abteilungsleiter im Verkauf	
Verkaufspersonal	
gelernt	
angelernt	
Andere (z.B. Verwaltung, Einkauf, Sekretärin..)	
Andere (Trainees, Praktikanten, Aushilfen..)	
Gesamt	

Wie viel Prozent Ihres Verkaufspersonals sind bei Zeitarbeitsfirmen beschäftigt?

Zeitarbeitsfirmen: Zahl oder % _____

Wie hoch ist die Fluktuation in Ihrem Unternehmen?
(Jahr 2007, nur Kündigungen und Entlassungen, wenn möglich keine Pensionierungen einbeziehen)

Gesamt: _____% pro Jahr
Verkaufspersonal: _____ % pro Jahr
Abteilungsleiter: _____ % pro Jahr

II. Qualifikationserwerb

Wie besetzen Sie üblicherweise die Stellen für Verkaufspersonal und Abteilungsleiter?
Prozentsatz (%) für die beiden Positionen

	Qualifikationsquellen	Vakante Positionen: Verkaufspersonal	Vakante Positionen: Abteilungsleiter
Extern	Total		
	Einstellung gelernter Verkaufskräfte		
	Einstellung und Weiterbildung angelernter (weniger qualifizierter) Mitarbeiter		
	Einstellung von Absolventen von Fachschulen, FHs, Unis		
Intern	Total		
	Besetzung mit eigenen Azubis, die gerade ihre Lehre abgeschlossen haben		
	Umsetzung erfahrener Fachkräfte		
	Weiterbildung von angelernten Mitarbeitern		
	Gesamt	100%	100%

Was sind die wichtigsten Vor- und Nachteile dieser Rekrutierungsquellen?

Vorteile: _____
Nachteile: _____

Falls Sie Weiterbildungen anbieten, um fachlich gering qualifizierte Angestellte als Fachkräfte einzusetzen:
Was beinhaltet die Weiterbildung für fachlich gering qualifizierte Angestellte?
Woche mit Vollzeitarbeit

	Wochen	%
Off the job - Schulung		
On the job - Schulung		
Produktive Arbeit: gelernte Aufgaben		
Produktive Arbeit: ungelernte Aufgaben		
Sonst		
Gesamt		100%

Wie lange dauert es, bis die volle Qualifikation erreicht ist?_____

Haben Sie in den letzten drei Jahren für diese Positionen (Verkaufspersonal, Abteilungsleiter) Absolventen mit einem Bachelor Abschluss eingestellt? Falls nicht, werden Sie es in den nächsten fünf Jahren tun?

Wurden schon eingestellt □ Ja □ Nein
Für die nächsten 5 Jahre geplant □ Ja □ Nein

Was beinhaltet die Einführungsausbildung für junge Hochschulabsolventen, die für Positionen als Abteilungsleiter ausgebildet werden?
Woche mit Vollzeitarbeit

	Wochen	%
Off the job - Schulung		
On the job - Schulung		
Produktive Arbeit: gelernte Aufgaben		
Produktive Arbeit: ungelernte Aufgaben		
Sonst		
Gesamt		100%

Wie lange dauert es, bis die volle Qualifikation erreicht ist? _____

III. Eigenschaften der Ausbildung

Die folgenden Fragen über die Lehrausbildung beziehen sich auf das Verkaufspersonal.
Was sind Ihre wichtigsten Ausbildungsprogramme? Wie lang ist die Ausbildungszeit? Wie viele Auszubildende sind in den jeweiligen Programmen?

	Name/Titel/Beruf	Lehrjahre	Anzahl der Azubis *(aktueller Bestand, über alle Jahre und Ausbildungsstufen)*
1.			
2.			
Gesamt			

Wieviele Auszubildende haben Sie 2007/08 eingestellt und wie viele drei Jahre zuvor?
Nur Verkaufsberufsgruppen

2007/08 _____ 2004/05 _____

Die kommenden Fragen bitte in Bezug auf Ihr Ausbildungsprogramm für Verkaufspersonal beantworten, entweder alle Programme oder das größte. Bitte kreuzen Sie an, was Sie hier angeben.

[Abdeckung: □ Alle Verkaufsberufsgruppen □ nur die größte Gruppe]

Was beinhaltet Ihre Ausbildung/sind die typischen Ausbildungsbestandteile?
Lehrprogramm für größte Berufsgruppe, Angaben entweder in Stunden oder in prozentualem Anteil der gesamten Stunden pro Woche

Aktivität		Durch-schnitt	Stunden (pro Woche oder %)			
			1. Jahr	2. Jahr	3. Jahr	4. Jahr
"Off the job" Schulung und Ausbildung	Externer Anbieter a. Berufsschule					
	b. spezielles Schulungszentrum/ Seminare					
"On the job" Schulung (an der Arbeitsstätte)						
Produktive Arbeit						
Sonstiges						
Gesamt						(100 %)

Falls die Auszubildenden normalerweise ein zu geringes Bildungsniveau mitbringen:
Stellen Sie weitergehende Ausbildungsmöglichkeiten zur Verfügung, um das Qualifikationsdefizit auszugleichen?

□ Ja □ Nein

Haben Sie mehr Bewerbungen als Stellen für Ihr Ausbildungsprogramm? Konnten Sie alle Stellen besetzen?
Momentane Situation oder Stand bei letzter Einstellung

□ Unbesetzte Stellen : ____ von _____ offenen Stellen
□ Zu viele Bewerber: ____ von _____ Bewerbern wurden angenommen (nur hinreichend Qualifizierte)
□ Übereinstimmung

Wie alt sind Ihre Auszubildenden, wenn sie die Lehre beginnen?
Stand bei letzter Einstellung
15-17 ____ % 18-20 ____ % 21-24 ____ % 25+ ____ %

Wie viele Frauen, wie viele Männer sind unter den Auszubildenden?
momentaner Bestand
Männer: _____ % Frauen: _____ % Zusammen: 100 %

Haben Sie spezielle Förderprogramme, um die Rate der Frauen (oder Männer) anzuheben?

□ Ja, für Frauen □ Ja, für Männer □ Nein

Welches Bildungsniveau sollten die Bewerber mitbringen? Welches Niveau haben sie? Wie verteilen sie sich auf die Niveaustufen?

Deutschland	Notwendig	Realität	Anteil
Hauptschulabschluss	□	□	_____%
Realschulabschluss	□	□	_____%
Abitur	□	□	_____%
Schweiz			
Sekundarschulabschluss (C)	□	□	_____%
Sekundarschulabschluss (A,B)	□	□	_____%
Matura	□	□	_____%

Welcher Anteil an Auszubildenden bricht die Lehre vor ihrem Abschluss ab?
(*einschließlich Probezeit falls möglich*)

____ % der Anfänger

Von den Auszubildenden, die ihre Ausbildung abschliessen, wie hoch ist da die Übernahmequote?

___ % der Auszubildenden erhalten ein Übernahmeangebot
___ %der Auszubildenden akzeptieren das Angebot

Welcher Anteil der Azubis, die ein Jobangebot angenommen haben kündigen innerhalb des ersten Jahres? _____ %

Welcher Anteil Ihrer Abteilungsleiter wurde im Unternehmen als Lehrling ausgebildet?
_____%

Welche weitere Ausbildungsmaßnahme ist für ausgelernte Azubis notwendig, um solche Positionen zu erreichen? _____

IV. Ausbildung: Institutionen und Vergütung

Wie hoch ist das durchschnittliche Gesamteinkommen für Fachkräfte und für Auszubildende? Falls sich der Grundlohn unterscheiden sollte, bitte ebenfalls angeben.

		Gesamt-einkommen (Durchschnitt)	Grundlohn (falls abweichend)
Fachkräfte (a) unmittelbar nach der Ausbildung			
(b) Gesamt			
21-jährige angelernte Mitarbeiter			
Auszubildende *Relevantes Kästchen ankreuzen:* □ nach Ausbildungsjahr	□ nach Alter □ keines		
1	16		
2	17		
3	18		
4	19		
	20		
	21^{+}		

Jahr 200 _____
Basis: □ Stündlich □ Wöchentlich □ Monatlich □ Jährlich

Erhalten die Auszubildenden einen Bonus? Falls ja, welcher Art?
Leistungsbezogen? Für einen Einzelnen oder eine Gruppe? Im Tarif einbegriffen? Basierend auf dem Umsatz oder durch Anerkennung vom Vorgesetzten?
□ Ja □ Nein

Erhalten Ihre Auszubildenden Sozialleistungen?
(Freiwillige) Krankenversicherung? Rentenversicherung? Kantine? Urlaub?
□ Ja □ Nein
Anmerkungen: _____
Die gleichen wie andere Arbeitnehmer?

Wie wird die Vergütung Ihrer Auszubildenden geregelt?
(Tarifverhandlungen, Entscheidung des Managements, Mindestlohn, ...)
_____

Wird das Gehalt der Facharbeiter nach <u>anderen</u> Kriterien und Methoden bestimmt als das Gehalt der Auszubildenden? □ Nein □ Ja

Falls Nein, zur nächsten Frage übergehen.
Erkennen Sie einen oder einige Gewerkschaftsverbände an?
d.h. für die Aushandlung von Gesamtarbeitsverträgen, entweder durch Ihr Unternehmen oder durch eine Arbeitgebervertreter, der für Sie spricht.
□ Nein □ Ja Name (n): _____

Haben Sie einen Betriebsrat/Personalkommission?

□ Nein □ Ja

Falls ja,: auf welchen Ebenen? □ im Betrieb □ im Unternehmen

Beeinflusst eine der folgenden Organisationen das Gehalt und die Anzahl der Einstellungen bzw. Übernahmen Ihrer Auszubildenden? Falls ja, wie?

Falls 'ja', Einfluss beschreiben:

Arbeitgeberverband □ Nein □ Ja: _____

Gewerkschaftsverbände □ Nein □ Ja: _____

Betriebsrat/Personalkommission □ Nein □ Ja: _____

Gab es in den letzten Jahren deutliche Veränderungen im Verhältnis der Gehälter der Auszubildenden im Vergleich zu den Gehältern der Fachkräfte?

□ Keine Veränderungen □ Eine oder mehrere Veränderungen

Wann? (größte Veränderung) _____

Um wie viel? _____

Gründe _____ *Probe: Wählte das Unternehmen die Veränderung?*

Falls eine oder mehrere Veränderungen auftraten,

Welche Effekte hatte die Veränderung des relativen Auszubildendengehalts auf die folgenden Schulungs- und Einstellungsmerkmale?

_____

Falls keine Veränderungen auftraten,

Was wäre der Effekt einer erheblichen Veränderung der Auszubildendengehälter
(z.B. ein 20%iger Anstieg oder Abfall) auf die folgenden Merkmale?
Alle anderen Umwelteinflüsse bleiben gleich

i. Effekt auf die Anzahl der neu eingestellten und übernommenen Auszubildenden:
   Anstieg der Gehälter _____
   Abfall der Gehälter _____
ii. Gebrauch von anderen Ausbildungsmethoden (Weiterbildung, Neueinstellung, etc.)
   _____

V. Organisatorische Merkmale der Ausbildung

Auf welcher Managementebene werden Entscheidungen über das Training von Auszubildenden getroffen? *Ein Kästchen in jeder Spalte ankreuzen*

Umfang	Inhalt (nur Training innerhalb des Unternehmens)
□ Zentrale	□ Zentrale
□ Kaufhaus/Geschäft	□ Kaufhaus/Geschäft

Haben Sie ein festgesetztes Budget für die Aus- und Weiterbildung?

□ Ja (Höhe: ____ % der Gehaltskosten) □ Nein

Falls ja,

Gibt es ein separates Budget für die Auszubildenden?

□ Ja (Höhe: _____ %) □ Nein

Wie wird mit den Ausbildungskosten, "Off the job" und "On the job" (Schulung an der Arbeitsstätte), in der Buchhaltung umgegangen?

„Off the job"-Ausbildung in einem separaten Ausbildungsbudget □ Ja □ Nein

"On the job"-Ausbildung in einem separaten Ausbildungsbudget □ Ja □ Nein

Kommentar: _____

Werden in Ihrem Unternehmen die Ausbildungskosten für Auszubildende geschätzt?

□ Ja □ Nein □ Keine Angabe

Falls ja,

Von wem wird die Schätzung durchgeführt? _____

Wie hoch sind die Kosten eines Auszubildenden? _____

Ist die analytische Basis der Brutto- oder Nettowert der Arbeitsleistung eines Auszubildenden?

□ brutto (z.B. ohne die Beachtung der Leistung des Auszubildenden)

□ netto (z.B. die Leistung des Auszubildenden wird von den Kosten abgezogen)

Haben die Resultate Ihr Ausbildungsprogramm beeinflusst?

Erhalten Sie Finanzhilfen jeglicher Art von öffentlichen Stellen, um die Ausbildungskosten zu decken? □ Ja □ Nein □ Keine Angaben

Falls ja,

Finanzquellen: _____

Höhe pro Auszubildenden: _____

Verknüpfte Konditionen: _____

VI. Finanzielle Aspekte

Veröffentlicht Ihr Unternehmen seine Gewinne, z.B. an der Börse?

□ Ja, auf dieser Ebene *(z.B. das Werk ist eine Firma)*

□ Ja, doch nur auf einer höheren Ebene *(z.B. durch die Muttergesellschaft)*

□ Nein

□ Sonstiges (z.B. freiwillige Veröffentlichung oder Veröffentlichung zu einem Teil)

Falls ja,

Wie häufig veröffentlicht Ihr Unternehmen die Gewinne?

□ Jährlich □ Halbjährlich □ Jedes Quartal

Haben Sie den Eindruck, dass die Veröffentlichung der Gewinne oder der Preis der Unternehmensaktien die Ausbildungsbudgets oder –methoden beeinflusst

□ Ja, sehr stark □ Ja, aber nicht sehr stark □ Nein

Nur börsennotierte Unternehmen:

Sind Ihrem Unternehmen in den letzten Jahren an der Börse starke Veränderungen in der Bewertung widerfahren?

□ Nein □ Ja

Gab es in den letzten Jahren einen bedeutenden Wechsel der Eigner (z.B. durch eine Übernahme) oder in der Finanzstruktur (z.B. Verstärkte Verschuldung)?

□ Ja □ Nein

Falls Ja, **Jahr:** _____

Inhalt:

_____

Falls Ja zu einer von beiden Fragen:

Wie groß war die Auswirkung auf das Ausbildungsbudget und die –methoden.

□ Signifikant □ keine signifikante Auswirkung

Inhalt: _____

Falls Nein zu beiden,

Welche Entwicklungen hinsichtlich der Ausbildungsbudgets und -methoden erwarten Sie, falls Ihre Firma von einer Private-Equity Gesellschaft gekauft werden würde und mehr Fremdkapital aufnehmen würde (Leverage-Effekt)?

'Leverage': Verhältnis von Fremdkapital zu Eigenkapital

□ Maßgebliche Effekte werden erwartet

□ Keine maßgeblichen Effekte werden erwartet

Wie stark ist der Wettbewerb auf dem Produktmarkt?

□ Stark □ Moderat □ Gering □ Keiner

Welchen Effekt hat der Konkurrenzdruck auf die Ausbildungsmaßnahmen?

□ Wenig oder kein Effekt □ Starker positiver Effekt □ Starker negativer Effekt

Wer sind Ihre stärksten Konkurrenten in Ihrem und in den anderen Ländern unserer Studie und wie ähnlich sind deren Produkte im Vergleich zu den Ihren?

Engineering with apprenticeship UK

I. Attributes of the employer

What is the status of your establishment?

□ stand-alone establishment/company
□ establishment within a multi-plant company
name:_____
□ division within a multi-plant company
□ non-employer training provider (*UK only*)

What is the nationality of your (parent) company? _____

Is your company (or its parent) listed on the stock market?

□ Yes □ No

If Yes,
Does your company have a controlling interest?
e.g., an individual or family owns 50%+ of equity

□ Yes; identity of interest: _____ □ No

What are your principal products (and/or services)? _____

What's your position in your main product market? (market share)
□ First □ second/third □ fourth/fifth □ sixth and below

What is more important to be competitive: quality (of products and services) or price?
□ Price □ Quality □ None (Price and Quality have the same importance)

In which batch sizes do you produce?

□ Large/medium □ Single/small □ Both

How many people do you employ?
In this establishment
January 1st 2008: _____ January 1st 2005: _____

What is the breakdown of employment by occupation (in production and maintenance only)?

	Number of employees *(1 Jan if possible)*
Management and professional	
Supervisors (production) and technicians	
Skilled manual (a) Production	
(b) Other (maintenance, tool-room, etc.)	
Less skilled (manual and non-manual)	
Other (trainees, internships, helpers...)	
Total	

How many of your skilled manual employees work on temporary contracts or on agency contracts? Number (or %): _____

What is your rate of labour turnover?
year 2007; quits and layoffs only, excluding retirements, if possible

All employees _____ % per year
Skilled manual _____ % per year
Supervisors, technicians _____ % per year

II. Sources of intermediate skills

How do you typically fill your vacancies for
(i) skilled manual employees and
(ii) production supervisors and technicians?
% of vacancies within each category

	Sources of skills	Skilled manual vacancies	Production supervisor, technician vacancies
External	Total		
	Skilled recruits		
	Upgrade training of semi-skilled/ less skilled recruits		
	Other recruits (university)		
Internal	Total		
	Your own continuing ex-apprentices		
	Other skilled employees (e.g. other trades)		
	Upgrade training of semi-skilled/ less skilled employees		
	Total	100%	100%

What are the principal advantages and disadvantages of these sources of skill?
Advantages: _____
Disadvantages: _____

If the company uses upgrade training of less skilled employees to fill skilled manual vacancies,

What is the content of your upgrade training for less skilled production workers?
Full-time equivalent weeks

	Weeks	%
Off the job training		
On the job training		
Productive labour: skilled tasks		
Productive labour: unskilled tasks		
Other		
Total		100%

How long does it take until the full qualification level is reached? _____

Have you recruited Bachelor-level graduates? Might you do so in the near future?

Have already recruited □ Yes □ No
Might recruit in future □ Yes □ No

What is the content of your initial training programme for young graduate recruits for supervisor or technician positions?

full-time equivalent weeks

	Weeks	%
Off the job training		
On the job training		
Productive labour: skilled tasks		
Productive labour: unskilled tasks		
Other		
Total		100%

How long does it take until the full qualification level is reached? _____

III. Attributes of apprentice training

UK only,

Do you participate in the Apprenticeships programme?

□ Yes □ No □ Not applicable

If yes, Is your company the prime contractor with the Learning and Skills Council?

□ Yes □ No □ Not applicable

What are your principal apprenticeship programmes? How long is the training period? How many apprentices do you have in them?

	Name/title/occupation	Duration (years)	Number of apprentices (current; stock, all years)
1.			
2.			
All			

What was your apprenticeship intake in 2007? In 2004?

All apprenticeship programmes

2007 _____ 2004 _____

Ask the following questions with reference to the apprenticeship programme for skilled manual occupations, either all programmes or one specific programme (e.g., the largest) only. Tick:

Coverage □ All skilled manual occupations

□ Specific occupation or programme: _____

What is the typical breakdown of an apprentice's activities during training?
Enter either actual hours or the share of total hours

	Provider (external)	Hours (actual or % total)			
		Yr 1	Yr 2	Yr 3	Yr 4
Off the job education and training	college				
	training company or centre				
Workshop training and practice (away from the workstation)					
On the job training (at the workstation)					
Productive labour: skilled tasks					
Productive labour: less skilled and unskilled tasks					
Other					
Total					

Do you make any special provision for low (prior) achievers in your apprenticeship programme?

□ Yes □ No

Do you have surplus places or surplus applications in your apprenticeship programme?
For your current or most recent cohort of entering apprentices; tick one box

□ Surplus places: ____ out of _____ vacancies
□ Surplus applicants: ____ out of _____ applicants (acceptable applicants only)
□ Neither

How old are your apprentices when they start their apprenticeships?
For most recent intake
15-17 ____ % 18-20 ____ % 21-24 ____ % 25+____ %

What is the mix of males and females among your apprentices?
Numbers or percentages; current stock (not the recent inflow)
Male: _____ Female: _____

Do you have any special programme(s) to increase female (or male) applications for apprenticeship?

□ Yes, for females □ Yes, for males □ No

What educational entry qualifications do you require your apprentices to have? What do they actually have?

	Required	Actual (typical)-	Share (%)
UK			
None	□	□	_____ %
GCSEs	□	□	_____ %
A Levels	□	□	_____ %

What share of entrants to your apprenticeship programme leave before completing?
For a recent entry cohort; include probationary period if possible

_____ % leave before completion

Of your apprentices who complete training, what share are offered an employment contract?

_____ % of completers are offered a contract
_____ % of completers accept a contract

What share of completers who accept a contract leave within one year?

_____ % of completers accepting a contract leave within a year

What qualification(s) do your apprentices normally acquire as part of their training?
Title(s): _____

UK only,

	Qualification title(s)	Level(s)
Work-based skills		
Technical knowledge		
Key Skills		

What proportion of your production supervisors and technicians has come through your own apprenticeship programmes? _____%

What further training after completion is needed for apprenticeship completers to reach such positions?

_____

IV. Apprenticeship: institutions and pay

The following questions involve apprenticeship for skilled manual occupations only
What are the total earnings of your manual employees and apprentices? If base pay rates are different, what are they?

		Total earnings (average p.c.)	Base pay rate *(if different)*
Skilled employees (a) immediately after training			
(b) all			
Semi-skilled employees of the age of 21			
Apprentices *Tick relevant box:* □ by year of training	□ by age □ other		
1	16		
2	17		
3	18		
4	19		
	20		
	21^{+}		

Period: 200_____
Pay period: □ Hourly □ Weekly □ Monthly □ yearly

Do your apprentices receive bonus pay? If so, what type of bonuses?
Performance based pay? Individual or group? Included in table?
□ Yes □ No

Do you pay your apprentices fringe benefits?
□ Yes □ No
Details: _____
Same as other employees?

How is the pay of your apprentices determined?
(collective bargaining, consultation, managerial decision, minimum wage, ...)
_____

Is the pay of skilled manual employees determined <u>differently</u> from the pay of apprentices?
i.e. Using different methods or criteria, or at a different time or place
□ No □ Yes

UK only,
Do you recognise trade unions?
i.e., for collective bargaining of terms and conditions of employment
□ No □ Yes: name(s): _____

Do you have an employee representation?
□ No □ Yes: on the level of □ company □ plant

What is the influence of the following institutions on the pay of your apprentices?

Trade unions	□ Strong	□ Some influence	□ None
Works council	□ Strong	□ Some influence	□ None
Employers' association	□ Strong	□ Some influence	□ None
UK only,			
Learning and Skills Council	□ Strong	□ Some influence	□ None
Sector Skills Council	□ Strong	□ Some influence	□ None

In recent years, have there been any significant changes in the pay of your apprentices <u>relative to the pay of skilled manual workers</u>?

Exclude pay increases that apply both apprentices and other employees

□ No changes □ One or more changes

When (largest)? _____

By how much? _____

Cause(s): _____

If one or more changes occurred,

What was the effect of the largest change in apprentice relative pay on your training and employment practices? _____

If no changes occurred,

What would be the effect on your training and employment practices of a substantial forced change in the pay of apprentices (e.g., a 20% fall or rise)?

i. Number of apprentices recruited and retained: _____

ii. Use of other sources of skill (recruitment, upgrade training, ...) : _____

V. Organisational attributes of training

At which level are decisions made in your company about apprentice training?

Tick one box in each column

<u>Volume</u>	<u>Content of training</u>
□ At headquarters	□ At headquarters
□ At plant level	□ At plant level

Do you have a formal budget for employee training? How big is it?

□ Yes (amount: ___% of payroll) □ No

If Yes **Is there a separate budget for apprenticeship training?**

□ Yes (amount: ____% of _____) □ No

How is the cost of training apprentices, off-the-job and on-the-job, handled in your accounts?

Off-the-job training in a separate training budget	□ Yes	□ No
On-the-job training in a separate training budget	□ Yes	□ No

Comment: _____

Has your company estimated the cost of training apprentices?

□ Yes □ No □ Not applicable

If Yes, **Who performed the study? _____**
Cost per apprentice? _____
□ Gross: no deduction of the value of apprentice output
□ Net: after deduction of the value of apprentice output
Did the results of the study affect your apprenticeship programme?

Do you receive any direct financial contribution to the cost of training apprentices from outside bodies, including public funds?
□ Yes □ No □ Not applicable
If Yes, **Source of funds: _____**
Amount per apprentice: **_____**
UK only: **Who pays it? _____**

VI. Financial attributes of the company

Does your company publish its audited net earnings (e.g., report to the stock market?)
□ Yes, at this level (i.e., the plant is a company)
□ Yes, at higher level only (e.g., parent company level)
□ No
□ Other (e.g., voluntary reporting, partial reporting)

If Yes, **How frequently does your company publish its net earnings?**
□ Annually □ Half yearly □ Quarterly

Do you have the impression that a need to report net earnings or support the company's share price affects your training budgets or practices?
□ Yes, strongly □ Yes, but not strongly □ No

Stock-market listed companies only:
Has your company experienced in recent years any substantial change in its position in relation to financial markets? □ No □ Yes

Have there been any substantial changes in recent years in the identity of your owner (e.g., through a takeover)?
□ Yes □ No
If Yes, **Year**: **_____** **Content: _____**

If Yes to either
What was the effect of the change (in financial position or ownership) on training budgets or practices? □ Significant effect □ No significant effect

If No to both,
Were your company become highly leveraged (e.g. were it to be bought by a private equity group), what effects would you expect on your training budgets or practices?
'Leverage': ratio of debt to equity in company's finance
□ Significant effect expected
□ No significant effect expected

How strong is the competition facing your company in your product market(s)?

□ Strong □ Moderate □ Low □ None

What effect does that competition have on your training programmes?

□ Little or no effect □ Strong effect: positive □ Strong effect: negative

Who are your principal competitors in your country and in the other countries in our study? How similar are their products to yours?

Engineering employer without apprenticeship training USA

I. Attributes of the employer

What is the status of your establishment?

□ stand-alone establishment/company
□ establishment within a multi-plant company
name: _____
□ division within a multi-plant company

What is the nationality of your (parent) company? _____

Is your company (or its parent) listed on the stock market? □ Yes □ No

If Yes, **Does your company have a controlling interest?**
e.g., an individual or family owns 50%+ of equity
□ Yes; identity of interest: _____ □ No

What are your principal products (and/or services)? _____

What's your position in your main product market?
□ Largest □ second/third □ fourth/fifth □ sixth and below

What is more important to be competitive: quality (of products and services) or price?
□ Quality □ Price □ None (Price and Quality have the same importance)

In which batch sizes do you produce?
□ Large/medium □ Single/small □ Both

How many people do you employ?
In this establishment
January 1st 2008: _____ January 1st 2005: _____

What is the breakdown of employment by occupation (in production and maintenance only)?

	Number of employees *(1 Jan if possible)*
Management and professional	
Supervisors (production) and technicians	
Skilled manual (a) Production	
(b) Other (maintenance, tool-room, etc.)	
Less skilled (manual and non-manual)	
Trainees	
Other (internship, helpers)	
Total	

How many of your skilled manual employees work on temporary contracts or on agency contracts? Number (or %): _____

What is your rate of labor turnover?
year 2007; quits and layoffs only, excluding retirements, if possible

All employees _____ % per year
Skilled manual _____ % per year
Supervisors, technicians _____ % per year

II. Sources of intermediate skills

How do you typically fill your vacancies for
(i) skilled manual employees and
(ii) production supervisors and technicians?

% of vacancies within each category

	Sources of skills	Skilled manual vacancies	Production supervisor, technician vacancies
External	Total		
	Skilled recruits		
	semi-skilled/less skilled recruits		
Internal	Total		
	Own trainees		
	Own employees (e.g. from other production places of your company) Skilled Unskilled		
	Total	100%	100%

What are the principal advantages and disadvantages of these sources of skill?

Advantages: _____
Disadvantages: _____

Do you recruit Bachelor or Master graduates for supervisor or technician positions?
Have already recruited □ Yes □ No
Might recruit in future □ Yes □ No

III. Attributes of training

What are your training programs/training strategies (if there exist different) on intermediate skill level?
How long is the training period? How many trainees do you have in them?

	Name/title/occupation	Duration (years)	Number of trainees (current; stock, all years)
1.			
2.			
All			

What was your trainee intake in 2007? In 2004?
All training programs
2007 _____ 2004 _____

Ask the following questions with reference to the training program for skilled manual occupations, either all programs or one specific program (e.g., the largest) only. Tick:

Coverage □ All programs □ Specific program: _____

What is the typical breakdown of a trainee's activities during training?
Enter either actual hours or the share of total hours

	Provider (external)	Hours (actual or % total)			
		Yr 1	Yr 2	Yr 3	Yr 4
Off the job education and training	college				
	training company or centre				
Workshop training and practice (away from the workstation)	Company-courses, own training facilities				
On the job training (at the workstation)					
Productivity compared to a fully skilled employee					
Other					
Total					

How many applications do you get per free positions in your training program?

How many % of the applicants are potentially acceptable?

How old are your trainees when they start their training?
For most recent intake (compulsory education until 16, most common, or 17/18)
15-17 ____ % 18-20 ____ % 21-24 ____ % 25+ ____ %

What educational entry qualifications do you require your trainees to have? What do they actually have?

	Required	Actual (typical)-	Share (%)
None	□	□	_____ %
High school diploma	□	□	_____ %
College degree	□	□	_____ %
Bachelor	□	□	_____ %

What share of entrants to your training programme leave before completing?
For a recent entry cohort; include probationary period if possible

_____ % leave before completion

Of your trainees who complete training, what share are offered an employment contract?

_____ % of completers are offered a contract
_____ % of completers accept a contract
□ Have already working contract

What share of completers who accept a contract leave within one year?

_____ % of completers accepting a contract leave within a year

Are externally validated qualifications acquired as part of the training?

What proportion of your production supervisors and technicians have come through your own training programs? _____%

What further training is needed for training completers to reach a production supervisors and technicians positions? (weeks/months...)

_____

IV. Institutions and pay

The following questions involve training for skilled manual occupations only
[What are the total earnings of your manual employees and trainees? If base pay rates are different, what are they?

	Base pay rate *(if different)*
Trainee	
Skilled employee immediately after training Skilled employee average Or Steps:	

Period: 200_____
Pay period: □ Hourly □ Weekly □ Monthly □ Yearly

Do your trainees receive bonus pay? If so, what type of bonuses?
Performance based pay? Individual or group? Included in table?

□ Yes □ No

Do you pay your trainees/employees fringe benefits?

□ Yes □ No

Details: _____

Same as other employees?

Do you recognize trade unions?

i.e., for collective bargaining of terms and conditions of employment

□ No □ Yes: name(s): _____

Do you have an employee representation?

□ No □ Yes: on the level of □ company □ plant

How is the pay of your trainees and your regular employees determined?

Trainees	**regular employees**
□ Collective bargaining company level	□ Collective bargaining company level
□ Collective bargaining plant level	□ Collective bargaining plant level
□ Consultation	□ Consultation
□ Managerial decision	□ Managerial decision
□ Minimum Wage	□ Minimum Wage
□ Other _____	□ Other _____

Do trainees usually get the same wage raises (at the same rate) as regular employees?

□ No □ Yes

What is the influence of the following institutions on the pay of your trainees?

Trade unions	□ Strong	□ Some influence	□ None
Works council/Empl. Repr.	□ Strong	□ Some influence	□ None
Employers' association	□ Strong	□ Some influence	□ None

In recent years, have there been any significant changes in the trainee pay relative to the pay of skilled manual workers?

Exclude pay increases that apply both trainees and other employees

□ No changes

□ One or more changes

When (largest)? _____

By how much? _____

Cause(s): *e.g. change of minimum wage, or excess of supply, etc.* _____

If one or more changes occurred,

What was the effect of the largest change in trainee relative pay on your training and employment practices?

_____

If no changes occurred,

What would be the effect on your training and employment practices of a substantial forced change in the pay of trainees (e.g., a 20% fall or rise)?

i. Number of trainees recruited and retained: _____

ii. Use of other sources of skill (recruitment, upgrade training, ...): _____

V. Organizational attributes of training

At which level are decisions made in your company about training?

Tick one box in each column

Number of trainees	Content of training
□ At headquarters	□ At headquarters
□ At plant level	□ At plant level

Do you have a formal budget for employee training? How big is it?

□ Yes (amount: ___% of payroll) □ No

If Yes

Is there a separate budget for the training programs?

□ Yes (amount: ____% of _____) □ No

How is the cost of trainee programs, off-the-job and on-the-job, handled in your accounts?

Off-the-job training in a separate training budget	□ Yes	□ No
On-the-job training in a separate training budget	□ Yes	□ No

Comment: _____

Has your company ever estimated in detail the cost of your trainee programs?

□ Yes □ No □ Not applicable

If Yes, **Who performed the study?** _____

Cost per trainee? _____

□ Gross: Trainee productivity not taken into account

□ Net: Trainee productivity taken into account

Did the results of the study affect your trainee program?

□ Yes _____ □ No

Do you receive any direct financial contribution to the cost of your trainee programs from outside bodies, including public funds?

□ Yes □ No □ Not applicable

If Yes, **Source of funds:** _____

Amount per trainee: _____

VI. Financial attributes of the company

Does your company publish its audited net earnings (e.g., report to the stock market?)

□ Yes, at this level (i.e., the plant is a company)
□ Yes, at higher level only (e.g., parent company level)
□ No
□ Other (e.g., voluntary reporting, partial reporting)

If Yes, **How frequently does your company publish its net earnings?**

□ Annually □ Half yearly □ Quarterly

Do you have the impression that a need to report net earnings or support the company's share price affects your training budgets or practices? (pressure for short-term performance?)

□ Yes, strongly □ Yes, but not strongly □ No

Stock-market listed companies only:

Has your company experienced in recent years any substantial change in its position in relation to financial markets? Any cost cutting program to raise profitability?

□ No □ Yes

Have there been any substantial changes in recent years in the identity of your owner (e.g., through a takeover)?

□ Yes □ No

If Yes, **Year**: _____ **Content:** _____

If Yes to either

What was the effect of the change (in financial position or ownership) on training budgets or practices?

□ Significant effect (Number, methods) □ No significant effect

If No to both,

Were your company become highly leveraged (e.g. were it to be bought by a private equity group), what effects would you expect on your training budgets or practices?

'Leverage': ratio of debt to equity in company's finance

□ Significant effect expected
□ No significant effect expected

How strong is the competition facing your company in your product market(s)?

□ Strong □ Moderate □ Low □ None

What effect does that degree of competition have on your training programs?

□ Little or no effect □ Strong effect: positive □ Strong effect: negative

Who are your principal competitors in your country and in the other countries in our study? How similar are their products to yours?

Retailing employer without apprenticeship USA/UK

I. Attributes of the organisation

What is the status of your organisation?

- □ stand-alone establishment or store/company
- □ establishment or store within a multi-plant company
  name: _____
- □ division within a multi-plant company
- □ non-employer training provider (*UK only*)

What is the nationality of your (parent) company? _____

Is your company (or its parent) listed on the stock market?

□ Yes □ No

If Yes,

Does your company have a controlling interest?

e.g., an individual or family owns 50%+ of equity

□ Yes; identity of interest: _____ □ No

What are your principal products and services? _____

What's your position in your main product market? (market share)

□ First □ second/third □ fourth/fifth □ sixth and below

What is more important to be competitive: quality (of products and services) or price?

□ Price □ Quality □ None (Price and Quality have the same importance)

How many people do you employ?

In this establishment or store January 1st 2008: ___ January 1st 2005: _____

What is the breakdown of employment by occupation (sales functions only)?

	Employment
Management and professional	
Supervisors and department managers	
Sales staff	
Less skilled sales staff	
Trainees	
Other	
Total	

How many of your sales staff work on temporary/agency contracts?

Temps (number or %): _____

What is your rate of labour turnover?

year 2007; quits and layoffs only, excluding retirements, if possible

All employees _____ % per year
Sales staff _____ % per year
Supervisors, dept managers _____ % per year

II. Sources of intermediate skills

How do you typically fill your vacancies for
(i) sales staff and
(ii) supervisors and department managers?

% of vacancies within each category

	Sources of skills	Sales staff vacancies	Supervisor and department managers
External	Total		
	Skilled recruits (experienced)		
	semi-skilled/less skilled recruits		
Internal	Total		
	Own trainees		
	Own employees (e.g. from other production places of your company) Skilled Unskilled		
	Total	100%	100%

What are the principal advantages and disadvantages of these sources of skill?

Advantages: _____

Disadvantages: _____

Do you recruit Bachelor or Master graduates for supervisor or department management positions?

Have already recruited □ Yes □ No

Might recruit in future □ Yes □ No

III. Attributes of training for sales staff

What are your principal training programmes for sales staff? How long is the training period? How many trainees do you have in them?

	Name/title/occupation	Duration (weeks)	Number of trainees (current; stock)
1.			
2.			
All			

What was your intake into training in 2007? In 2004?
All basic training for sales staff
2007 _____ 2004 _____

Coverage □ All programmes □ Specific programme: _____

What is the typical breakdown of a trainee's activities during training?
Enter either actual hours or the share of total hours

	Provider (external)	Hours
How many hours until fully trained? How long is the training period?		
Off the job education and training	specialist training company or training centre	
Workshop training and practice (away from the workstation, PC-based training)		
How many days of shadow-Working? (on the job)		
Rest of training under supervision?		
Other		
Total		

How many applications do you get per free positions in your training program?

How many % of the applicants are potentially acceptable?

How old are your trainees/new employees when they start their training?
For most recent intake (compulsory education until 16, most common, or 17/18)
15-17 ___ % 18-20 ____ % 21-24 ____ % 25+____ %

What educational qualifications do you require your trainees to have? What do they actually have?

	Required	Actual (typical)-	Share (%)
UK			
None	□	□	_____ %
GCSEs	□	□	_____ %
A Levels	□	□	_____ %
USA			
None	□	□	_____ %
High school diploma	□	□	_____ %
College degree	□	□	_____ %
Bachelor	□	□	_____ %

What share of entrants to your initial training program typically leave before completing?

For a recent entry cohort; include any probationary period if possible

_____ % of entrants leave before completion

Of your trainees who complete training, what share are offered an employment contract?

_____ % of completers are offered a contract

_____ % of completers accept a contract

□ Have already working contract

What share of trainees/employees who complete initial training leave within one year?

_____ % of completers leave within a year of completion

Are externally validated qualifications acquired as part of the training?

What proportion of your supervisors and department managers have come through your own training programs? (went through your initial training?) _____%

How and when do you identify future supervisors/department managers, to they get training before they get the supervisor position or afterwards?

_____

IV. Training: institutions and pay

What on average is the total pay of initial trainees and experienced sales staff?
If base pay rates differ from earnings, what are they?
Total pay (i.e., earnings): all cash payments, including extra months and performance bonuses; average per employee in category
Base pay rate: as specified by a collective agreement, where applicable

	Base pay rate *(if different)*
Trainee	
Skilled employee immediately after training Skilled employee average Or Steps:	

Period: 200_____
Pay period: □ Hourly □ Weekly □ Monthly □ Yearly

Do your trainees receive bonus pay? If so, what type of bonuses?
Performance based pay? Individual or group? Included in table?
□ Yes □ No

Do you pay your trainees/employees fringe benefits?
□ Yes □ No
Details: _____
Same as other employees?

Do you recognise trade unions?
i.e., for the collective bargaining of terms and conditions of employment
□ No □ Yes; name (s): _____

Do you have an employee representation?
□ No □ Yes: on the level of □ company □ plant

How is the pay of your trainees and your regular employees determined?

Trainees
□ Collective bargaining company level
□ Collective bargaining plant level
□ Consultation
□ Managerial decision
□ Minimum Wage
□ Other _____

regular employees
□ Collective bargaining company level
□ Collective bargaining plant level
□ Consultation
□ Managerial decision
□ Minimum Wage
□ Other _____

Do trainees usually get the same wage raises (at the same rate) as regular employees?
□ No □ Yes

What is the influence of the following institutions on the pay of your trainees?

Trade unions	□ Strong	□ Some influence	□ None
Works council/Empl. Repr.	□ Strong	□ Some influence	□ None
Employers' association	□ Strong	□ Some influence	□ None

In recent years, have there been any significant changes in the trainee pay relative to the pay of skilled manual workers?

Exclude pay increases that apply both trainees and other employees

□ No changes

□ One or more changes

When (largest)? _____

By how much? _____

Cause(s): *e.g. change of minimum wage, or excess of supply, etc.* _____

If one or more changes occurred,

What was the effect of the largest change in trainee relative pay on your training and employment practices?

_____

If no changes occurred,

What would be the effect on your training and employment practices of a substantial forced change in the pay of trainees (e.g., a 20% fall or rise)?

i. Number of trainees recruited and retained: _____

ii. Use of other sources of skill (recruitment, upgrade training, ...) : _____

V. Organisational attributes of training

At which level are decisions made in your company about sales staff training?

Tick one box in each column

Volume	Content (in-company training only)
□ At headquarters	□ At headquarters
□ At plant level	□ At plant level

Do you have a formal budget for employee training? How big is it?

□ Yes (amount: ___% of payroll) □ No

If Yes

Is there a separate budget for the training programs?

□ Yes (amount: ____% of _____) □ No

How is the cost of trainee programs, off-the-job and on-the-job, handled in your accounts?

Off-the-job training in a separate training budget	□ Yes	□ No
On-the-job training in a separate training budget	□ Yes	□ No

Comment: _____

Has your company ever estimated in detail the cost of your trainee programs?

□ Yes □ No □ Not applicable

If Yes, **Who performed the study? _____**

Cost per trainee? _____

□ Gross: Trainee productivity not taken into account

□ Net: Trainee productivity taken into account

Did the results of the study affect your trainee programme?

□ Yes _____ □ No

Do you receive any direct financial contribution to the cost of your trainee programs from outside bodies, including public funds?

□ Yes □ No □ Not applicable

If Yes, **Source of funds: _____**

Amount per trainee: _____

VI. Financial attributes of the company

Does your company publish its audited net earnings (e.g., report to the stock market?)

□ Yes, at this level (i.e., the plant is a company)

□ Yes, at higher level only (e.g., parent company level)

□ No

□ Other (e.g., voluntary reporting, partial reporting)

If Yes, **How frequently does your company publish its net earnings?**

□ Annually □ Half yearly □ Quarterly

Do you have the impression that a need to report net earnings or support the company's share price affects your training budgets or practices?

□ Yes, strongly □ Yes, but not strongly □ No

Stock-market listed companies only:

Has your company experienced in recent years any substantial change in its position in financial markets, high volatility of share price? Any cost cutting programs to raise profitability?

□ No □ Yes

Have there been any substantial changes in recent years in the identity of your owner (e.g., through a takeover)?

□ Yes □ No

If Yes, **Year**: _____ **Content: _____**

If Yes to either

What was the effect of the change (in financial position or ownership) on training budgets or practices?

□ Significant effect □ No significant effect

If No to both,

Were your company become highly leveraged (e.g. were it to be bought by a private equity group), what effects would you expect on your training budgets or practices?

'Leverage': ratio of debt to equity in company's finance

□ Significant effect expected □ No significant effect expected

How strong is the competition facing your company in its product market(s)?

□ Strong □ Moderate □ Low □ None

What effect does that competition have on your training programmes?

□ Little or no effect □ Strong effect: positive □ Strong effect: negative

Who are your principal competitors in your country and in the other countries in our study? How similar are their products to yours?

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CURRICULUM VITAE

Personal Information

Name: Silvia Teuber

Place of Birth: Kempten, Germany

Date of Birth: May 28, 1982

Education

Mar. 2008-Apr. 2012	**Universität Zürich**, Zurich, CH PhD student (Supervisor: Prof. Dr. Backes-Gellner)
Sept. 2010	**Harvard University**, Cambridge, USA Visiting PhD student at the Minda de Gunzburg Center for European Studies (Supervisor: Prof. Dr. Iversen)
Sept. 2009-Feb. 2010	**Massachusetts Institute of Technology**, Cambridge, USA Visiting PhD student at the Department of Political Science (Supervisor: Prof. Dr. Thelen)
Apr. 2007-Feb. 2008	**Universität Basel,** Basel, CH PhD studies (Prof. Dr. Beckmann)
Oct. 2001-Oct. 2006	**Ludwig-Maximilians-Universität (LMU),** Munich, GER Studies of Human Resource Education
Mar. 2005-Nov. 2006	**Bayerische EliteAkademie**, Munich, GER Scholarship of Bavarian companies and universities to promote future managers
Aug. 2003-Jan. 2004	**University of Lund,** Lund, SWE Visiting student at the School of Economics and Management
Sept. 1992-June 2001	**Hildegardis-Gymnasium**, Kempten, GER

Work Experience

Mar. 2008-Mar. 2012	**Universität Zürich**, Zurich, CH Head of administration of Swiss Leading House "Economics of Education, Firm Behavior and Training Policies"; Research & teaching assistant at the chair of Empirical Research in Business, Industrial Relations and HRM
Apr. 2007-Feb. 2008	**Universität Basel,** Basel, CH Research and teaching assistant
Oct. 2006-Apr. 2007	**f.u.n. netzwerk|nordbayern GmbH,** Nuremberg, GER Freelance management consultant, market research and business planning for new products and technologies
Apr. 2005-Apr. 2006	**Chair of HR Education, LMU,** Munich, GER Student research and teaching assistant
Feb. 2004-Feb. 2005	**Business Administration Faculty, LMU,** Munich, GER Tutor for freshman students
Feb. 2004-Mar. 2004	**Sparkasse Allgäu,** Kempten, GER Internship in controlling and insurance departments
Aug. 2002-Oct. 2002	**Deutsche Bank 24,** Kempten, GER Internship in building loans and customer services